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DEPARTMENT OF DEFENSE

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ASSISTANT SECRETARY OF DEFENSE-PUBLIC AFFAIRS

Last year at this time, employers throughout the country demonstrated what can be done to help the jobless youth of our country.

Through the 1965 Youth Opportunity Campaign, private employers, Federal, state and local governments averted a crucial youth unemployment problem by providing over one million extra summer work-training opportunities.

The challenge of the summer of 1966 now faces the nation. It is just as important and just as pressing as it was last year.

The statement of the President on the 1966 Youth Opportunity Campaign appears on page 1.

Army and Air Force Set Responsibilities on Fixed and Rotary Wing Aircraft

The responsibilities of the Army and the Air Force in the control and employment of certain types of fixed and rotary wing aircraft were set by the two Service in a joint decision released April 15.

The Army will transfer its CV–2 Caribou and CV–7 Buffalo aircraft to the Air Force and the Air Force will be in charge of all future intra-theater fixed-wing tactical airlift. Other types of fixed wing aircraft are not affected.

Also included in the joint decision was the announcement that the Army will be responsible for all rotary wing support for intra-theatre movement, fire support, supply and resupply of Army forces and those Air Force elements working with Army units to coordinate air support.

The Air Force will retain responsibility for rotary wing aircraft involved in Air Force search and rescue and special air warfare missions and Air Force rotary wing administrative support missions.

In cases of operational need, the joint or unified commander is authorized to attach the CV–2, CV–7 and CV–123 type aircraft to Army corps, division, or subordinate units in the field to perform supply, resupply, or troop-lift functions.

Both Services will continue to consult on the design of follow-on fixed wing aircraft to assure that the take-off, landing and load-carrying characteristics meet the needs of the Army for supply, resupply and troop-movement functions.

Joint Army/Air Force development of vertical take-off and landing aircraft (VTOL) will continue and the consideration of methods of employment and control of this type of aircraft will continue as the aircraft evolve.

Actions required by this agreement will be completed by Jan. 1, 1967.

Red Ball Express Again on the Move

The famed Red Ball Express of World War II, which saw an endless stream of GI trucks forming a mobile supply line between our troops in Europe and the seaports where supplies were landed, is once again on the move.

However, the method of transportation has changed from trucks to huge transport planes of the Military Airlift Command and the area of operations has been switched from Europe to Southeast Asia.

Despite these differences, the purpose remains the same—to get priority cargo where it is needed in the fastest possible time.

The 1966 version of the Red Ball Express, established by the Department of Defense last December, keeps vitally needed supplies moving rapidly from the west coast of the United States through the 5,000-mile supply route to Vietnam.

This has been made possible by the rapid transit methods of the Red Ball Express which allows a total time of 168 hours between the time a requisition is made in Vietnam until the arrival of the requested material.

Industry has helped to make the Red Ball Express program work by adopting accelerated techniques to meet deadlines. One Defense Supply Agency supply center reported that business firms accepted 253 telephoned orders and completed direct shipments on them to California. Of this number, 199 Red Ball Express requirements were filled on time within 48 hours and the remaining 54 within 72 hours.

DEFENSE INDUSTRY BULLETIN

Published by the Department of Defense

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The *Defense Industry Bulletin* is published monthly by the Business & Labor Division, Directorate for Community Relations, Office of the Assistant Secretary of Defense (Public Affairs). Use of funds for printing this publication was approved by the Director of the Bureau of the Budget.

The purpose of the *Bulletin* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *Bulletin* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *Bulletin* is distributed without charge each month to representatives of industry and to agencies of the Department of Defense, Army, Navy and Air Force. Requests for copies should be addressed to the Business & Labor Division, OASD(PA), Room 2E813, The Pentagon, Washington, D.C. 20301, telephone, OXford 5-2709.

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President Johnson Urges National Support of 1966 Youth Opportunity Campaign

The following is President's Johnson's statement relating to the 1966 Youth Opportunity Campaign:

In 1965, faced with the alarming prospect of hundreds of thousands of young Americans—16 through 21—looking for work in the summer and not finding it, this Administration launched a Youth Opportunity Campaign.

In 1966, we are faced with that prospect again.

In 1966, 1,800,000 of our youth will look for work in the summer without finding it.

Some of these youngsters will be looking for temporary summer jobs. But getting those jobs may be the difference between being able to go back to school or not going back.

Almost a million of them will be trying to find their places in life, trying to become independent, self-sufficient.

If we fail them, it will mean that we are failing our future.

- It will mean that one out of every six white 16- through 21-year olds looking for work won't find it.
- It will mean that one out of every five non-white youths looking for work will not find it.
- Finally, it will mean that we have allowed our youth who will represent 14.3 percent of our country's summer work force to become 50 percent of our summer unemployed.

Last month, I asked the Vice President to chair a Task Force on Summer Domestic Programs. Their recommendations included one that there be a 1966 Youth Opportunity Campaign.

I accept that recommendation.

In 1965, a concerted effort, particularly by private employers large and small, produced a million jobs for our young people. Our country again proved its ability to respond to a serious situation.

In 1966, we can, in my judgment, increase by at least a million the work and training opportunities this summer for our boys and girls—in a way that is good for them and good business for all of us.

The Private Employer's Role.

I hope and believe that private employers, who were largely responsible for our 1965 success, will exceed that success in 1966.

- There are 620,000 firms in this country which employ from 10 to 100 workers. I hope that at least half of these firms will agree to take on one extra summer trainee.
- There are 60,000 larger plants employing over 25 million people. If each of them will add one extra summer trainee for each 100 employees, this will mean another 250,000 trainees.

I hope other large organizations—labor unions, trade associations, churches, colleges—will make a similar effort. This could mean another 25,000 to 50,000 trainees.

So this program can get started immediately, I am asking that these things be done:

- That all private employers who are disposed to do so make their own arrangements immediately for taking on one or more extra trainees this summer.
- If advice of this action, including the name of the trainee, is given by mail to the Secretary of Commerce, Youth Opportunity Campaign Unit, Washington, D.C., it will be appropriately acknowledged.
- That all other private employers and organizations who are willing to cooperate in this program so advise the nearest State Employment Office.
- That all State Employment Offices be advised, through the U.S. Employment Service, to establish special Youth Opportunity registers for this special summer program.
- That all boys and girls 16 through 21 who want to work this summer and who don't have jobs get in touch immediately with the nearest Employment Service Office. If this is difficult, write to the Department of Labor, Youth Opportunity Campaign Unit, Washington, D.C.

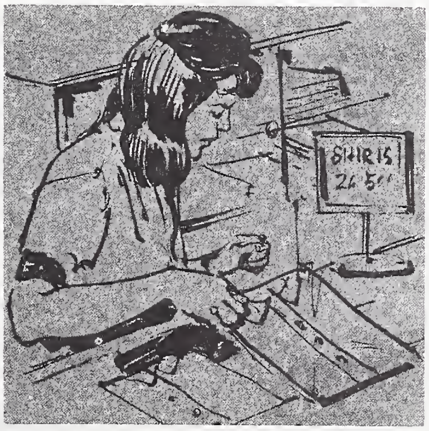
The Federal Government's Role.

I expect the Federal Government to do its share.

I am again directing the Government departments and agencies to make every effort to find meaningful work or training opportunities this summer for one extra trainee for every 100 employees on their present payrolls.

- This is to be done, for the most part, in the field offices and installations around the country.
- These opportunities will be given, so far as this is practicable, to boys and girls 16 through 21 who need them the most because of economic or educational disadvantages.
- There is a potential employment here of 25,000 trainees.
- Programs under the Vocational Education Act will be expanded from last year's 7,500 students to 26,000 students this summer.
- The Work-Study program originally planned to provide opportunity for 76,000 students in over 1,400 communities will be expanded to assist 100,000 more.
- I am asking that activity under the Manpower Development and Training Act be immediately intensified to provide training opportunities for at least 80,000 youth.

(*Continued on Page 12*)



Found: A Practical Configuration Management System

by
Charles Borum
Chief, Configuration Management, Pershing Project Office
U.S. Army Missile Command, Redstone Arsenal, Ala.

The development of practical configuration management systems has become increasingly important to the U.S. Army in the control and management of complex weapon development. Compressed R&D programs and world-wide equipment deployment demand the timely identification, control and accounting of equipment configuration prior to delivery and during field use.

During early production of the Army's Pershing missile system, a problem which has long faced weapon developers cropped up: with increasing quantities of equipment going to the field from the manufacturer and with many subcontractors building items which ultimately found their way into the system, it was imperative that all equipment be delivered in strict conformance with engineering drawing requirements. Furthermore, it was necessary that any design changes be uniformly incorporated into hardware prior to delivery, unless specifically planned for later field installation. A hit-and-miss procedure could play hob with a subsequent field modification program. Compounding the problem was the fact that, on Pershing, R&D and early production schedules overlapped.

The Pershing Project Manager's Office at the Army Missile Command, Redstone Arsenal, Ala., went to work on the knotty problem with the cooperation of Martin Company's Orlando (Fla.) Division, prime contractor. The solution they came up with in October 1963, particularly in the realm of configuration accounting techniques, has proven extremely effective and is felt to offer significant improvement over other methods in use.

The system affected both in-house and breakout contractor efforts. Although many aspects of the program are new in concept, considerable attention has been given to integrating the management and control functions in a manner consistent with currently established Army lines of communication.

The Pershing application concerns a complex weapon system. However, the basic building blocks are adaptable to most levels of weapons management. Since most of the techniques of configuration identification and control are relatively standard within the Army (Figure 1), this article will be limited to a description of configuration accounting techniques utilized in the Pershing program.

The purpose of the configuration accounting program is to provide accurate configuration definition and information retrieval for items of equipment through all phases of design, development, production and operational service life. The accurate and timely availability of such information is a management tool in addition to the obvious technical benefits provided. In conjunction with a controlled field modification program, the availability of equipment for its tactical mission is not jeopardized because of configuration incompatibilities.

Basic elements of the computer mechanized system are baseline control, change accountability and configuration records.

Baseline Control. With increased emphasis on fixed price contracting, the requirement for configuration definition has become a necessity. Identification of all elements of the technical data package describing the items must be detailed, including the appropriate change levels. During the performance under the contract all necessary changes must be identified as supplemental to the contract definition and appropriate certification established to assure their incorporation prior to equipment delivery. In order for a field modification program to be effective, equipment must be delivered in strict conformance with previously planned configuration requirements. The Pershing system identifies the contract configuration and authorizes changes and certification of accomplishment prior to Government acceptance of the equipment.

Change Accountability. The change accountability tab run (Figure 2) requires a manufacturing work area to accomplish an authorized change. The requirement details the part number affected, equipment item and effectivity and appropriate change level to be incorporated. Updated and issued daily to affected work areas, the tab run shows each outstanding change action. A requirement remains open until certified by Quality and Army Ordnance Inspection, through the use of a Configuration Accountability Transmittal Card (Figure 3), that the work has been accomplished. The completed transaction is then stored in computer memory until prior to delivery when "as-built" information is required for configuration records. In addition, as serialized items are installed in higher level assemblies, completion accountability transmittals are forwarded to Configuration Management to show actual configuration and serial numbers of lower level items installed in major equipment.

Configuration Identification	Configuration Control	Configuration Accounting
Specifications	Change Review and Planning	Baseline Control
Drawings	Change Authorization	Mechanized Change Accountability (Prime Contractor)
Documentation Policy and Procedures	Systems Change Board	Mechanized Configuration Record (Prime and Breakout Contractors)
Serialization—Traceability		Mechanized Field Configuration Record
Quality Assurance Provisions		Configuration Accountability Transmittals
Special Acceptance Inspection Equipment		
Packaging Data Sheets		

Figure 1.

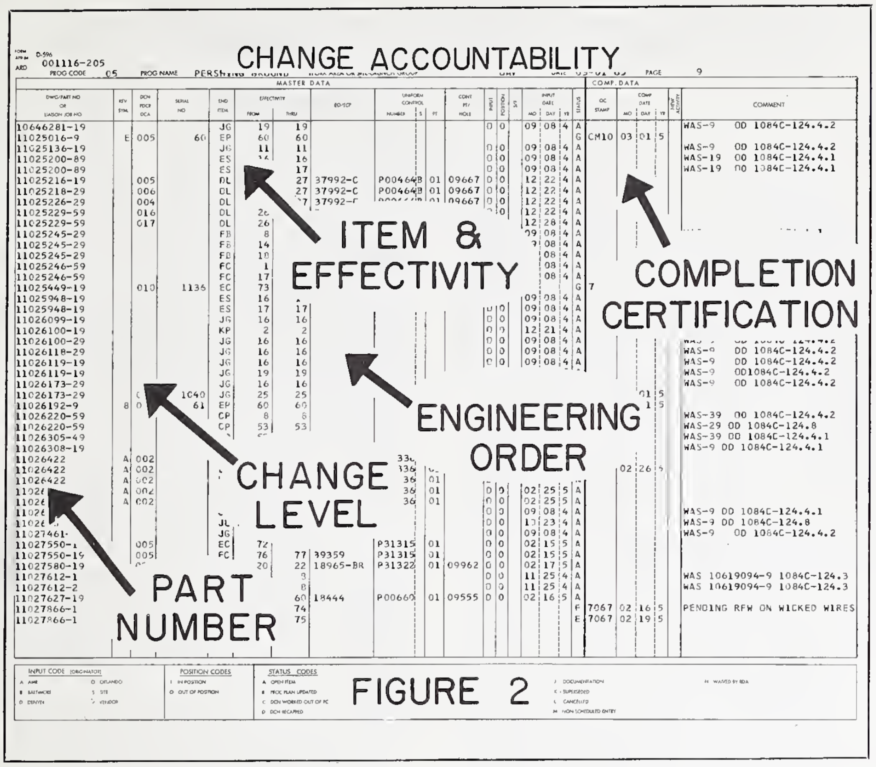
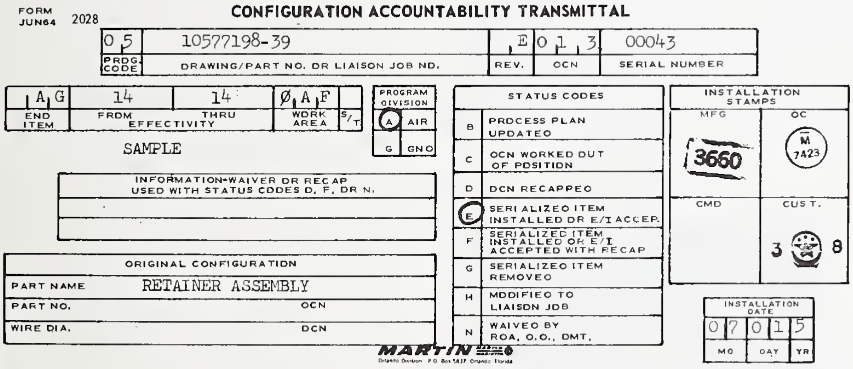

CHANGE ACCOUNTABILITY
ITEM & EFFECTIVITY
COMPLETION CERTIFICATION
ENGINEERING ORDER
CHANGE LEVEL
PART NUMBER

FIGURE 2



FORM JUN64 2028

CONFIGURATION ACCOUNTABILITY TRANSMITTAL

PROG. CODE	DRAWING/PART NO. OR LIAISON JOB NO.	REV.	OCN	SERIAL NUMBER
0 5	10577198-39	E	0 1 3	00043

END ITEM	EFFECTIVITY FROM	EFFECTIVITY THRU	WORK AREA	S/T
A G	14	14	0 A F	

PROGRAM DIVISION: [✓ A] AIR G GNO

SAMPLE

INFORMATION-WAIVER OR RECAP USED WITH STATUS CODES D, F, OR N.

ORIGINAL CONFIGURATION

PART NAME RETAINER ASSEMBLY

PART NO. OCN

WIRE DIA. DCN

STATUS CODES

- B PROCESS PLAN UPDATED
- C OCN WORKED OUT OF POSITION
- D DCN RECAPPED
- [✓ E] SERIALIZED ITEM INSTALLED OR E/I ACCEP.
- F SERIALIZED ITEM INSTALLED OR E/I ACCEPTED WITH RECAP
- G SERIALIZED ITEM REMOVED
- H MODIFIED TO LIAISON JOB
- N WAIVED BY ROA, O.O., DMT.

INSTALLATION STAMPS

MFG 3660 QC M 7423

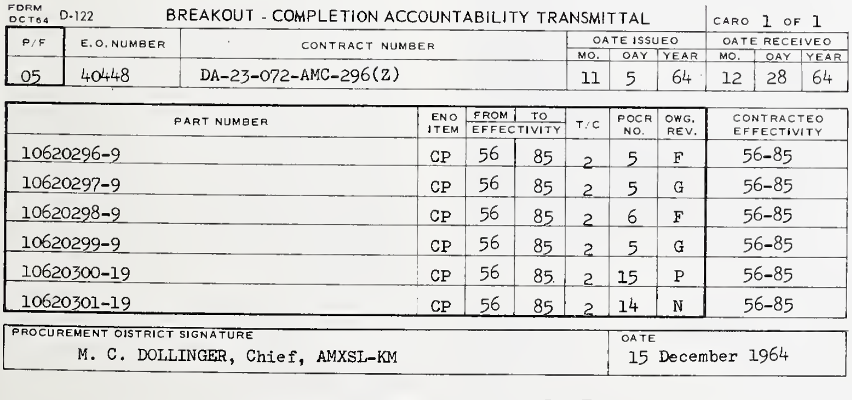
CMD CUST. 3 8

INSTALLATION DATE 0 7 0 1 5 MO DAY YR

MARTIN

Orlando Division P.O. Box 5837 Orlando, Florida

IN HOUSE CAT. CARD



FORM OCT64 D-122

BREAKOUT - COMPLETION ACCOUNTABILITY TRANSMITTAL

CARD 1 OF 1

P/F	E.O. NUMBER	CONTRACT NUMBER	DATE ISSUED MO.	DAY	YEAR	DATE RECEIVED MO.	DAY	YEAR
05	40448	DA-23-072-AMC-296(Z)	11	5	64	12	28	64

PART NUMBER	END ITEM	FROM EFFECTIVITY	TO EFFECTIVITY	T/C	POCR NO.	DWG. REV.	CONTRACTED EFFECTIVITY
10620296-9	CP	56	85	2	5	F	56-85
10620297-9	CP	56	85	2	5	G	56-85
10620298-9	CP	56	85	2	6	F	56-85
10620299-9	CP	56	85	2	5	G	56-85
10620300-19	CP	56	85	2	15	P	56-85
10620301-19	CP	56	85	2	14	N	56-85

PROCUREMENT DISTRICT SIGNATURE M. C. DOLLINGER, Chief, AMXSL-KM

DATE 15 December 1964

BREAKOUT CAT. CARD

Figure 3.

Configuration Records. Configuration records define the engineering requirements and certify that equipment has been built to the proper contract and engineering definition. An example of a configuration record utilized for initial delivery of equipment is shown in Figure 4 (see inside back cover). The "as-engineered" portion of the record details the part numbers, quantities, effectivity, contract baseline and required change level. The as-built portion of the record details the actual fabricated configuration, including the incorporation of changes released subsequent to contract baselining and the serial numbers of lower level items installed in major equipment. As-built certification is accomplished through a Configuration Accountability Transmittal (CAT. Card) as shown in Figure 4. This is completed by the contractor's manufacturing organization and certified by Quality Assurance and Procurement Inspection personnel.

Breakout Configuration Records. Breakout contracting presented a significant management problem in that the prime contractor originated Engineering Change Packages affecting equipment fabricated in another section of the country by a breakout contractor. For this purpose the basic configuration record system was further refined to a Breakout Configuration Record system. In general, a breakout contract definition is substituted for the as-built portion of the basic configuration record. Thus, the exact difference between the technical definition of the equipment at the prime contractor and the breakout contract definition is apparent at all times. In order to assure that changes released by the prime contractor are incorporated into the breakout contract, the Configuration Accountability Transmittal (Figure 3) is forwarded to the cognizant Army Procurement District with the Engineering Change Package. When the change is negotiated into the breakout contract, the Procurement District notes the negotiated effectivity and forwards the card back to the prime contractor to update the breakout configuration record. In the event that the negotiated effectivity differs from that documented and requested, then appropriate action (re-engineering, etc.) can be accomplished early enough in the program to avoid equipment and field modifi-

(*Continued Inside Back Cover*)

Safeguarding Nuclear Superiority

by
Col. Ralph S. Garman, USAF

Of all the Free World responsibilities the United States has assumed since 1945, none has been of more importance than the nuclear deterrence to all-out war.

Today, more than 20 years since the atomic age began, nuclear deterrence continues to provide the shield behind which free men can work and build for peace.

The success of our nuclear deterrence has resulted from an unfaltering national will to preserve peace and deny victory to any aggressor. It has also resulted from a dynamic, imaginative, well-supported technology which has provided weapons and knowledge to give the United States unquestioned superiority in nuclear firepower.

In spite of the restrictions imposed by the limited nuclear test ban treaty, which requires that testing can be conducted only underground, the Department of Defense, Atomic Energy Commission and industry have continued to upgrade weapons capabilities, to improve the survivability of weapon systems, and to advance nuclear know-how on many fronts.

The Air Force Special Weapons Center, which is a part of the Air Force Systems Command, is a longtime member of the military-civilian team charged with applying advancing nuclear technology to national security needs.

Located at Kirtland AFB, Albuquerque, N.M., the Special Weapons Center is a next-door neighbor to the Defense Atomic Support Agency's Field Command, the Atomic Energy Commission's Albuquerque Operations Office, and Sandia Corp., an AEC prime weapons contractor. The Los Alamos Scientific Laboratory is about 70 miles to the north.

The Special Weapons Center has a hand in supporting all of the national safeguards under the nuclear test ban treaty. Briefly, the safeguards require:

- The conduct of underground nuclear weapons test programs.
- Maintenance of modern nuclear lab facilities and programs.
- Maintenance of facilities and resources necessary to initiate prompt nuclear tests in the atmosphere and other environments should they ever be required.
- Improvements of the capability to monitor the terms of the treaty and to detect violations.

When Secretary of Defense Robert S. McNamara testified in favor of the test ban treaty before the Senate Foreign Relations Committee in the summer of 1963, he promised that the United States would maintain the vitality of our weapons laboratories, would continue to conduct a program of underground tests, and would retain the administrative talent and other resources required for quick expansion of the test program into additional environments.[1]

Each one of these promises has been kept.

It is firm national policy to retain a readiness-to-test capability in every relevant environment, and to support a dynamic technology in weaponry, nuclear effects research, systems survivability, and test detection and analysis. It is also national policy to make certain that we maintain what Secretary McNamara has called "a strong deterrent to abrogation" of the test ban treaty and, through all available means, to render the risk of abrogation minimal.[2]

Col. Ralph S. Garman, USAF, is the Commander of the Air Force Special Weapons Center of the Air Force Systems Command. Prior to this assignment, he commanded the Air Force missile Development Center. An Air War College graduate, his research and development career dates back to the 1940's when he was involved in the experimental development of fighters and research aircraft.

An important part of the U.S. capability to resume atmospheric testing on short notice is based on an airborne diagnostic technique first successfully demonstrated during the later phases of Operation Dominic, our last series of in-the-air tests conducted in 1962.[3] This technique—which frees atmospheric testing from land-based instrumentation—resulted from the Special Weapons Center's development of extremely accurate airborne distance measuring equipment which made it possible to perform diagnostics of atmospheric tests from an airborne array without ground support. This development provides a simultaneous, slant range measurement of distances between all aircraft in the test array and the nuclear device, as well as the distance between aircraft.

Heart of the test array consists of Special Weapons Center B-52 drop aircraft and three NC-135 diagnostic aircraft flown by the center and instrumented by the Atomic Energy Commission's three weapons laboratories — Los Alamos, Sandia and Lawrence.

In the autumns of 1964 and 1965, full-scale exercises were successfully conducted in the Pacific by the Defense Atomic Support Agency's Joint Task Force Eight to proof-test the airborne diagnostic capability and to provide realistic training for some 1,500 Defense Department, Atomic Energy Commission and contractor personnel.

The exercises involved dropping instrumented test simulation objects from the B–52's while the three NC–135's simulated gathering nuclear diagnostic data.

In addition to planning for Air Force support of resumed atmospheric tests and maintaining the basic air array for nuclear test readiness, the Special Weapons Center provides air support of underground tests of nuclear weapons and detection techniques. It maintains a detachment in Nevada which furnishes and coordinates all atomic test site aerial activities there.

The center furnished airborne support of the 1965 underground detonation on Amchitka Island in the Aleutians which helped scientists in their

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[1] *Secretary of Defense McNamara's statement upholding the nuclear test ban treaty, Aug. 13, 1963, Senate Foreign Relations Committee.*

[2] *Ibid.*

[3] *AEC Annual Report to Congress for 1964, p. 71.*

(Continued on Page 12)

The Defense Communications Satellite Program

by
Lt. Gen. Alfred D. Starbird, USA
Director, Defense Communications Agency

The Defense Department has been heavily engaged for several years in activities related to a satellite communications system. The Department expects to realize an initial limited satellite communications capability in the very near future with the Initial Defense Communications Satellite System.

DOD has certain unique requirements which can best be met by a satellite communications system. As early as 1958, the Defense Department's first experiment in satellite communications was made with the launching of Score by the Army Signal Research and Development Laboratory. Sent into orbit by the Air Force in December of that year, this satellite had a life of 12 days but in that time demonstrated real time relay of voice, code and teletype messages. In 1960 the Army and the Air Force collaborated again to put up Courier, a rather complex experiment. During its 18-day life, Courier received and re-transmitted 118,000,000 words.

In 1960 the Secretary of Defense combined all DOD satellite communications efforts under the U.S. Army Advent Management Agency. However, by 1962, it was found that the Advent concept of a large synchronous satellite launched by the proposed Centaur booster stretched the state of the art. The project was wisely cancelled.

The efforts of NASA with the Relay series and the Bell System with the Telstar series has further increased DOD confidence in achieving satellite communications for military usage. In 1962, the Secretary of Defense established the Defense Communications Satellite Program (DCSP) and assigned to the Defense Communications Agency the responsibility for integration of its ground and space efforts.

By October 1964, DCSP project definition studies were completed with the proposal for a medium altitude, random, polar orbit system with the Atlas/Agena booster. Each booster was to place seven satellites in orbit and there were to be four launchings.

The military has peculiar stringent demands for survivability, reliability, flexibility and ability to move rapidly into remote areas. Its requirement is for a limited number of circuits to reach any point, but assured ones.

As the Communications Satellite Corporation was being established and as its organization evolved, however, it became apparent that the capability of the ComSat Corporation to provide national security communications should be investigated. After extensive discussions and joint studies with the ComSat Corporation from October 1963 to July 15, 1964, the Secretary of Defense concluded that the DOD must proceed with its own system to meet certain DOD needs.

During the period of study, the Titan III-C program had developed to a point where certain scheduled development launches could be used to launch DOD R&D satellites. Studies indicated that, for the initial research and development system, DOD could use Titan III-C to carry eight satellites into circular orbit in an equatorial plane at near-synchronous altitudes. Consequently, DOD decided to establish its initial defense communications satellites in a random equatorial pattern at an altitude of 18,250 miles.

By this time, also, DOD had established the satellite as a 32-inch polyhedron, with 32 watts of silicon solar cell power, receiving in the 8,000 megacycle and transmitting in the 7,000 megacycle bands. The satellite would radiate approximately three watts in a toroidal pattern and would have no control system.

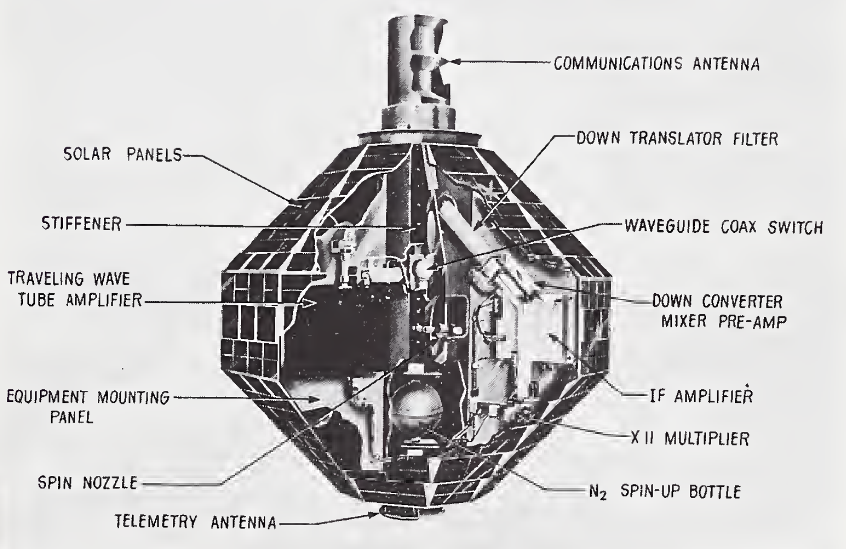
Three Titan III-C launches in early 1966 are planned, each carrying up to eight satellites to a near-synchronous altitude. Each satellite will be dispensed at a different velocity which will cause separation at rates of four degrees per day. Satellites will be spin stabilized at 150 RPM. A mean-time-before-failure of one and one-half years or better is expected.

Transportable ground terminals employing 40-foot parabolic antennas are now being deployed to sites around the world. Our older 60-foot terminals at Fort Dix, N.J., and Camp Roberts, Calif., are being readied. Late this year a smaller transportable terminal will be added—one capable of very rapid installation and use in contingency/crisis situations.

During the initial DCSP development, invaluable experience was gained participating with NASA in the Syncom project. NASA orbited Syncoms II and III. They are now stationed at 70° East and 165° East Longitude, respectively. DOD pro-

(*Continued on Page 8*)

SPIN STABILIZED COMMUNICATIONS SATELLITE



ABOUT PEOPLE

DEPARTMENT OF DEFENSE

Lt Gen. **Andrew J. Goodpaster,** USA, has been named to relieve **Lt. Gen. David A. Burchinal,** USAF, as Dir. of the Joint Staff, Joint Chiefs of Staff.

Frederick S. Wyle has been sworn in as Dep. Asst. Secretary for Policy Planning in the Office of the Asst. Secretary of Defense (International Security Affairs).

Two changes took place in the Office of the Asst. Secretary of Defense (Comptroller) in April. **Joseph S. Hoover** was sworn in on April 20 as Principal Dep. Asst. Secretary and **George W. Berquist** assumed the position of Dep. Asst. Secretary of Defense (Management Systems Development) on April 15.

Effective July 1, 1966, **Maj. Gen. Arthur W. Oberbeck,** USA, will take command of Joint Task Force Eight, a subordinate command of the Defense Atomic Support Agency. He will succeed **Maj. Gen. John D. Stevenson, USAF.**

Dr. Stephen J. Lukasik has been appointed Dir. of Nuclear Test Detection for the Advanced Research Projects Agency.

Maj. Gen. James C. Sherrill, USAF, has been assigned to duty as Special Asst. for Strategic Mobility with the Joint Chiefs of Staff.

Brig. Gen. Paul W. Tibbets, Jr., USAF, has been named Dep. Commander for Management and Systems, Military Traffic Management and Terminal Service.

RAdm. Winston H. Schleeff, USN, will take command of the Defense Fuel Supply Center, Alexandria, Va., in June. He succeeds **Lt. Gen. W. O. Senter, USAF,** who is retiring.

Col. Thomas L. Fisher, USAF, has been reassigned as Asst. to the Dir., Policy Planning Staff, Office of the Asst. Secretary of Defense (International Security Affairs).

Capt. G. C. Heffner, USN, has been designated as Inspector General for the Defense Supply Agency, Alexandria, Va. He will assume the position in July succeeding **Col. Talbert I. Martin,** USA, who will become Commander, Defense Depot, Memphis, Tenn.

Two Defense Contract Administration Services Regions have new directors. **Col. Loren P. Murray, USAF,** succeeds **Capt. Richard D. White, USN,** at Atlanta, Ga., and **Capt. W. Glenn Normile, USN,** succeeds **Col. Charles F. Burley, USAF,** at Dallas, Tex.

DEPARTMENT OF THE ARMY

Maj. Gen. William C. Gribble, became Dep. Chief of Research and Development, at Hq., Department of the Army, in April.

Command of the Desert Test Center, Salt Lake City, Utah, was assumed by **Brig. Gen. John J. Hayes** in another change last month.

Brig. Gen. Richard H. Free has been assigned to duty as Dep. Dir., Research and Development, Army Materiel Command, effective June 1.

Col. William M. Mantz has assumed command of the Army Natick Laboratories in Massachusetts. Col. Mantz, who comes to the assignment from duty as Commanding Officer, Support Command, Alaska, has also been nominated for promotion to brigadier general.

Col. Miles L. Wachendorf will succeed **Col. Curtis W. Chapman, Jr.,** as Executive to the Army Chief of Engineers, Washington, D.C., Aug. 15.

Lt. Col. Harold W. Yount, Project Manager for Rifles at Headquarters, Army Weapons Command, Rock Island, Ill., has been promoted to colonel.

Lt. Col. William J. McClain has been assigned to the Army Missile Support Command as Provost Marshal for Redstone Arsenal, Ala.

Lt. Col. Harold E. Shaw has been named Commander, Army Nuclear Defense Laboratory, Edgewood Arsenal, Md. **Edwin H. Bouton** was named acting Technical Director of the Nuclear Defense Lab.

DEPARTMENT OF THE NAVY

George V. Shaefer has been named to head the U.S. Naval Oceanographic Office's West Coast Detachment which will be located at Point Loma, Calif. The new detachment will act as liaison between Government agencies, non-Government scientific activities and the Naval Oceanographic headquarters in Washington, D.C., in addition to its regular technical and scientific support mission.

RAdm. Frank C. Jones will be relieved in July by **Capt. Stuart C. Jones,** as Commander, Boston Naval Shipyard. The new commander is now serving as Production Officer, Charleston Naval Shipyard.

Brig. Gen. Frank E. Garretson has been named Marine Corps Director of Information. Gen. Garretson takes over from **Col. Paul M. Moriarty,** who has been interim Director of Information since the detachment of **Brig. Gen. A. H. Adams** last February. Col. Moriarty will be Gen. Garretson's deputy.

DEPARTMENT OF THE AIR FORCE

The following named officers will be retired in the grade of general on dates indicated:

Gen. Bernard A. Schriever, Commander, Air Force Systems Command, Aug. 31.

Gen. Robert M. Lee, Air Dep. to Supreme Allied Commander, Europe, July 31.

Gen. Jacob E. Smart, Dep. Commander in Chief, U.S. European Command, July 31.

The following three officers have been nominated for promotion to general and named to replace the above retiring officers on indicated dates.

Lt. Gen. William S. Stone, Air Dep. to Supreme Allied Commander, Europe, Sept. 1.

Lt. Gen. James Ferguson, Commander, Air Force Systems Command, Sept. 1.

Lt. Gen. David A. Burchinal, Dep. Commander in Chief, U.S. European Command, Aug. 1.

Maj. Gen. Leighton I. Davis, has been assigned as Dep. Commander, Air Force Systems Command, for Global Range.

Brig. Gen. Charles H. Roadman is the new Commander of the Aerospace Medical Div., AFSC, Brooks AFB, Tex. He relieves **Brig. Gen. Thomas H. Crunch.**

Col. Gilbert L. Curtis has been assigned as Commander of the 2848th Air Base Group, Air Force Logistics Command, Norton AFB, Calif.

Col. David H. Barger has been named Dir., Gemini Support, Air Force Systems Command, with offices in the Federal Office Building, Washington, D.C.

Col. William F. Dolby has been named Dir., Civil Engineering, AFSC, Air Force Western Test Range, Vandenberg AFB, Calif.

Col. John T. Ely, has been reassigned as Asst. Dep. for Radiation Warfare Support, Foreign Technology Div., AFSC, Wright-Patterson AFB, Ohio.

The new Dir., Research Programs, Office of Aerospace Research, is **Col. Robert E. Smith.**

Navy Collocates Oceanographic R & D Groups

Three Navy technological groups have been collocated at the Naval Research Laboratory (NRL), Washington, D. C., to coordinate their oceanographic programs.

Involved in the move were NRL's newly formed Ocean Science and Technology Group, the NRL Ocean Science and Engineering Division and the Research and Development Department of the Naval Oceanographic Office.

Although the three groups will be working together, they will each remain under technical supervision of their own research director.

The venture will provide increased efficiency in oceanographic research due to the excellent laboratory facilities available at the Naval Research Laboratory and closer working ties.

Dr. J. Brackett Hersey, who has accepted appointment as Special Assistant for Oceanography to the Assistant Secretary of the Navy (Research and Development), will be the director of the oceanographic group.

Project Management Review: A Concept

by

George W. Bergquist

The concept of project management continues to flourish in the Navy Department. Since the creation of the Naval Material Support Establishment (NMSE) in December 1963, which placed the Navy Material Bureaus under one head, i.e., the Chief of Naval Material, 27 efforts have been designated for exceptional or "project" management. This includes nine projects whose managers report to the Chief of Naval Material and 18 projects whose managers report to the material bureau chiefs. Priorities, size, complexity, interface relationships and relative importance generally determine to whom the project manager will report.

By reason of the increased implementation of project management within the Naval Material Support Establishment, Vice Admiral I. J. Galantin, the Chief of Naval Material, is taking steps to assure himself that the disciplines, procedures and methods of project management are vigorously exercised. For example, two pilot tests have recently been completed of a procedure which has been called "Project Management Review." This concept consists of the designation of a team, called the Project Management Review Team, whose assignment is primarily to inquire into the effectiveness of the management of a project. Additionally, the team inquires into the degree to which the project's program objectives have been accomplished. Incident to the latter, observations will be made by the team as to when a project ought to be phased down or disestablished.

The two pilot tests have been so successful that Admiral Galantin has made the decision to implement this concept on a permanent basis. Implementing instructions, at the time of this writing, have been prepared and are in the process of approval and distribution. Implementation and administration of the project review procedure have been assigned to the Plans Division, Project Management Branch (Code MAT 111), Office of Naval Material, Navy Department, Washington, D.C.

The ultimate success of the reviews is recognized to be substantially dependent on the experience, knowledge and objectivity of the team. For this reason careful attention will be paid to the qualifications of persons designated as Project Management Review Team members. Implementing instructions assure that the Project Management Branch, Plans Division, Office of Naval Material, provides permanent team leadership and has at least one member on each review team. This organization specializes in the implementation of the concepts and policies of project management throughout the total Naval Material Support Establishment. Its members are graduates of the Defense Weapons System Management Course, a three-month Department of Defense course in project management given at Wright-Patterson AFB, Ohio. Members, in many instances, have had substantial, actual experience in project management organizations. Functional specialists from other organizations of the Office of Naval Material may be called on to serve either as full- or part-time members of the Project Management Review Team, depending on the size of the project, its complexity and the type of problems anticipated. The project manager is expected to designate one individual from his staff to act as a central point of contact during the reviews. The project manager himself is encouraged to participate to the maximum degree possible.

Mr. George W. Bergquist is the newly appointed Dep. Asst. Secretary of Defense (Management Systems Development). At the time this article was written he was Dep. Chief of Naval Material for Programs and Financial Management. Mr. Bergquist is a graduate of Harvard University and has a Masters Degree in Public Administration.

To ensure the adequacy of reviews, a check list has been devised for use by the review team. Also, a questionnaire is forwarded to the project manager in advance of the review to which he is expected to respond. The major divisions of the check list are:

- Authority and responsibility of the project manager.
- Project charter.
- Program identification.
- Project priority.
- Dollar size and complexity.
- Qualification for project management.
- Project history.
- Project visibility.
- Project staffing.
- Communications channels.
- Reporting.
- Project status reviews and evaluation.
- Management information systems.
- Financial management.
- Planning.
- Technical direction and implementation of DOD directives.

Each of the foregoing major divisions is subdivided so that there are approximately 150 specific questions in the check list.

The questionnaire requires the project manager to respond to about 18 questions on control, authority and responsibility. Additional information is required concerning the support that the project manager receives from material bureaus and Naval field activities.

The intent is to conduct the reviews with the least possible disruption to the operations of the project organization. At the conclusion of the review, the team presents its independent findings, conclusions and recommendations to the project managers, the Chief of Naval Material, and, if the project reviewed is at the bureau level, the chief of the bureau to whom the project manager reports. The project manager may or may not concur with the findings of the team. If he does not, his reasons may be stated during briefings. Insofar as possible, the team is expected to resolve controversial areas before the final briefing to top management.

The findings, conclusions and recommendations of the review team are formalized in a final report to which the project manager may attach an addendum if he chooses to nonconcur with any of the conclusions or recommendations of the team.

It is planned to make wide distribution of the findings of each review. Cross-fertilization of ideas is a primary objective, and this cross-fertilization is expected to contribute substantially to the overall understanding of project management concepts, policies, procedures and problems throughout the NMSE.

The Instrumentation Ships Project (PM–5), under Captain A. F. Hancock, USN, was the first project selected for pilot test of the concept. It was chosen for its relatively small size and also because of its dependence on the Bureau of Ships to provide support in areas such as procurement, engineering services and administrative matters.

The project had been established at the direction of DOD as part of the objective to centralize the management of all DOD activities in support of the National Range Program. PM–5, though small, is complex, since its business is conducted with agencies outside the Navy, principally with the range activities of the Air Force and the National Aeronautics and Space Administration (NASA). The assignment of the project manager is to fulfill the Navy's responsibility for the construction, conversion and modification of all general purpose instrumentation ships in support of DOD and NASA world-wide tracking requirements. This includes the instrumentation ships in support of NASA's Apollo Program.

The results of the Project Management Review of the Instrumentation Ships (PM–5) Project are considered to be both significant and useful. For example, the review served to confirm:

- That the concept of using existing Navy bureaus to support the project is sound.
- The need for the project manager's careful execution of formal, explicit, interface agreements when two or more DOD components and outside agencies are engaged in related work.
- The fact that the Project Management Review provides the project manager with an incentive to identify his "managerial" problems and, to bring them to the attention of higher authority if such assistance is needed.
- The need for "closed-loop" communications between the project manager and those to whom he is responsible.

In addition to the four major conclusions above, a number of specific administrative and procedural areas for improvement were identified, and corrective action has been taken.

Recognizing the rather unique character of the Instrumentation Ships Project, the decision was made to test the concept further by applying it to a more conventional all-Navy project. Accordingly, the next project selected for review was the All-Weather Carrier Landing System Project (PM–6) under Captain F. R. Fearnow, USN. This project has for its objective the development of an all-weather aircraft/carrier landing system oriented toward fixed wing aircraft.

Again, the proposed check list and project manager's questionnaire were applied to this project. As in the case of the review of the Instrumentation Ships Project, the check list and questionnaire proved to be useful guides in ensuring the desired coverage. At the completion of the review some significant observations were made, principally bearing on the importance of control of funds and contracting, for successful project management.

Project managers have, in general, welcomed the idea of the reviews. For example, one project manager commented that the check list would provide him with a helpful self check.

There will be no contacts with industry during the reviews. The reviewers will, however, be inquiring into areas relating to the project manager's administration of contracts with industry, the kinds and frequency of reporting required of industry and other related factors. It is conceivable that the concept could be extended to include occasional visits to contractors' plants but this is not planned at present.

The current schedule calls for six additional reviews to be conducted during this calendar year.

Experience to date has demonstrated that the project review concept is a useful and effective management tool from the standpoint of top Navy management as well as the individual project manager.

Defense Communications Satellite Programs

(*Continued from Page 5*)

vided the ground terminals now emplaced in Hawaii, the Philippines, Saigon and Asmara, Eritrea. A terminal was installed aboard the USNS Kingsport. Beginning with NASA's Gemini 3, this station has provided valuable service in relaying communications from ocean sites through Syncom to satellite ground terminals in the Pacific, and thence by conventional means to the NASA Manned Space Flight Center in Houston. Six-foot antenna terminals were installed aboard two of the Navy's combatant ships.

NASA, having completed its experimental tests, has transferred operational responsibility of the Syncoms to the DOD. Conduct of operational testing is continuing, with availability also for emergency operational use in the Pacific and Indian Ocean areas.

The Defense Department, with the cooperation of the ComSat Corporation, conducted tests over Early Bird and found that it provided reliable and high quality service, limited only by the effect which long transmission times have on certain error detection and correction techniques. National policy, as expressed by the President in his annual report to Congress, Feb. 15, 1965, indicates the Government will limit its DCSP to a capacity necessary to handle "unique and vital national security needs." DOD will use "commercial satellites and other common carrier communications systems for the transmission of the bulk of its (DOD) traffic between the United States and various overseas areas." Therefore, DOD is closely following ComSat plans.

In July 1965, NASA requested the manager of the National Communications System to determine Intelsat's capability to provide communications in support of the Apollo manned flights from certain land and ship locations. The Intelsat proposal for two satellites over the Pacific and Atlantic Oceans has been tentatively accepted. NASA is now negotiating with the ComSat Corporation as manager for Intelsat, for provision of service in late 1966.

Meanwhile, DOD is looking further into the future. Six contractors developed conceptual studies on what should be the Defense Communications Satellite System of the longer range future. These studies are now being evaluated and shortly the Defense Communications Agency will make recommendations to the Secretary of Defense on how to proceed to meet needs in the 1970's and later period.

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> Each Defense Procurement Circular is designed to place new or changed policy or procedures in effect prior to publication of an Armed Service Procurement Regulation (ASPR) revision. ASPR subscribers will receive DPC's and ASPR revisions through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

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Deep-Water Metalcutting Torch, Phase I Final Report. North American Aviation, for the Navy, 1965, 37 pp. Order No. AD–624 167. $2.

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Transverse Antenna Feed Study. Sperry Gyroscope Co., for the Air Force, Jan. 1966, 112 pp. Order No. AD–629 546. $4.

Literature Survey Pertaining to Electrically Small Antennas, Propagation Through Vegetation and Related Topics. Stanford Research Institute, for the Army, Jan. 1966, 300 pp. Order No. AD–629 155. $6.

Synthesis of Group IV Organometallic Polymers and Related Compounds. Institute for Organic Chemistry, Utrecht, Netherlands, for the Air Force, Dec. 1965, 92 pp. Order No. AD–629 554. $3.

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A Study of Military Electronic and Electromechanical Specification Part Identification Requirements. North American Aviation, for the Air Force, Feb. 1966, 64 pp. Order No. AD–629 544. $3.

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Techniques for Microwave Components of Reduced Weight. Sylvania Electronic Defense Laboratories, Mountain View, Calif., for the Army, Nov. 1965, 42 pp. Order No. AD–629 930. $2.

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All Purpose Matrices for Com-

(*Continued on Page 11*)

CALENDAR OF EVENTS

May 23–26: Annual Meeting and News Conference of Aviation/Space Writers Assn., New York Hilton, New York City.

May 23–27: Annual Convention of Navy League, Miramar Hotel, Santa Monica, Calif.

May 31–June 2: American Society for Quality Control Meeting, New York City.

June 6–10: Society of Automotive Engineers Convention, Detroit Mich.

June 6–10: Society of Plastic Industries Convention, New York City.

June 7–9: Armed Forces Communications & Electronics Assn. Convention, Sheraton-Park Hotel, Washington, D.C.

June 12–15: American Society for Mechanical Engineers Meeting, Philadelphia, Pa.

June 19–23: Assn of Industrial Advertisers Meeting, New York City.

June 19–24: Communication Workers of America Meeting, St. Louis, Mo.

June 20–23: American Nuclear Society Meeting Denver, Colo.

June 21–24: Data Processing Management Assn. Meeting, Chicago, Ill.

June 22–24: 22nd Annual Meeting of the Institute of Navigation, Cedar Rapids, Iowa.

July 5–9: American College Public Relations Assn. Meeting, Boston, Mass.

July 11–15: National Conference of Weights and Measures, Denver, Colo.

July 16–19: National Audio-Visual Assn. Meeting, Washington, D.C.

July 19–23: National Tool, Die and Precision Machining Assn. Meeting, Hot Springs, Va.

Aug. 22–Sept. 10: Science Congress, Tokyo, Japan.

Aug. 26–Sept. 1: American Legion National Convention, Washington, D.C.

DASA Information and Analysis Center Serves Nuclear Research Field

The Defense Atomic Support Agency (DASA) data center at 816 State Street, Santa Barbara, Calif., reequipped and relocated in modern quarters, has been renamed the DASA Information and Analysis Center (DASIAC). The center is now equipped to serve an extended community of interest in the nuclear research field.

DASA is the joint services organization which plans and coordinates DOD nuclear weapons programs. The agency's responsibilities include nuclear weapons effects research and underground test programs, supervision of the nuclear stockpile, and contingency planning in other nuclear fields. DASA serves as the primary technical and operational contact point between the Military Services and agencies of the Atomic Energy Commission.

In addition to DASA and other DOD agencies, DASIAC information sources now include many other Government agencies. Data from nuclear and nonnuclear tests as well as research reports developed under theoretical laboratory and simulation programs sponsored by DASA and other organizations are regularly received. Under its DASA charter, the center continuously seeks data from agencies not directly associated with DASA-funded research programs. Program areas include electromagnetic blackout, geomagnetics, fluid dynamics, blast wave propagation, ionization and many others.

The center issues several formal publications. The *DASIAC Bibliography* is a bi-monthly collection of abstracts of recent reports and data. *The Nuclear Weapons Effects Review* (NWER) is a classified quarterly technical journal for articles concerning current NWER studies and related topics. Special reports include evaluation of programs, state of the art reports, critical reviews of experimental data or theories, and special facility and instrumentation surveys.

Computer Program Library Services, regularly announced in DASIAC publications, include fully documented in-house programs for cases where transfer to using agencies is practical. Other programs, monitored by the center, are extremely large and complex, or are still under development. In such cases, inquiries are referred to the organizations responsible for the development of the programs.

Visitors to the center are provided private study areas and facilities for the examination of virtually all basic forms of data. Clearance through Service or contractor security channels is required for visits to or requests for information from the center.

USAF Plans Electronics Briefing for Industry

A classified advanced planning briefing for industry will be jointly sponsored by the Electronic Systems Division, Air Force Systems Command, L. G. Hanscom Field, Mass., and the National Security Industrial Association, in Boston, June 28–30.

The briefing is being held to keep industry informed on future plans and policies on the Electronic Systems Division.

The three-day session will provide background on electronic systems long-range planning information through which industry can formulate its objectives.

Included in the briefing will be advanced systems planning of the Electronic Systems Division, as well as related advanced technology developments of the Rome Air Development Center, Griffiss AFB, N.Y., and the Air Force Avionics Laboratory, Wright-Patterson AFB, Ohio.

Firms interested in attending the briefing should write to the National Security Industrial Association, Department N, Suite 800, 1030 15th St. N.W., Washington, D.C. 20005.

Testing Handbook Available to Industry

The first in a series of handbooks on nondestructive testing developed by the U.S. Army Materials Research Agency and published by the Office of the Assistant Secretary of Defense (Installations and Logistics) is now being distributed.

The handbook, titled "Electromagnetic Testing" (H-54), provides technical guidance to quality and reliability assurance personnel concerned with nondestructive testing techniques used in the detection of discontinuities and other material defects in metals.

Interested persons can purchase the handbook from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., for $1.25 a copy.

A second handbook in the nondestructive testing series, "Radiography" (H-55), has been approved for publication and will be available in about three months.

MEETINGS AND SYMPOSIA

JUNE

Panel Workshop on **Basic Research in Malaria**, June 15–17, at Walter Reed Army Institute of Research, Washington, D.C. Sponsor: Walter Reed Army Institute of Research. Contact: Dr. Elvio H. Sadum, Dept. of Medical Zoology, Walter Reed Army Institute of Research, Washington, D.C. (Area Code 202) RA 3-1000, ext. 3308

Eleventh Science Seminar, June 15–22, at Albuquerque, N.M. Sponsor: Air Force Office of Scientific Research, Office of Aerospace Research. Contact: David L. Arm, Director, Air Force Office of Scientific Research Science Seminar, Air Force Office of Scientific Research, Washington, D.C. 20333, (Area Code 202) 696–6127.

Government Bids, Proposals and Contracts for Small Business Enterprises Institute, June 17–18, at Pittsburgh, Pa. Sponsor: Smaller Manufacturers Council, an affiliate of the Chamber of Commerce of greater Pittsburgh, Pa. Contact: Earl W. Eriksson, Executive Director, Small Manufacturers Council, Chamber of Commerce Building, Pittsburgh, Pa. 15219 (Area Code 412) 391–3400, ext. 15.

Seventh Informal **Photochemistry** Conference, June 20–22, at Rensselaer Polytechnic Institute, Troy, N.Y. Co-sponsors: Army Research Office-Durham and Rensselaer Polytechnic Institute. Contact: Dr. George Wyman, Director, Chemistry Div., Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706, (Area Code 919) 286–2285, ext. 33.

International Conference on **Crystal Growth**, June 20–24, in Boston, Mass. Sponsor: Air Force Cambridge Research Laboratories. Contact: Charles S. Sahagian (CRWPC), Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Bedford, Mass. 01731, (Area Code 617) CR 4–6100, ext. 3298.

Gordon Research Conference on **Interaction and Transport in Physical, Chemical and Biological Systems**, June 20–24, at Proctor Academy, Andover, N.H. Sponsor: Office of Naval Research. Contact: Mrs. P H. Tenniswood, Code 444, Office of Naval Research Washington D.C. 20360 (Area Code 202) OXford 6–1538.

JULY

1966 Annual Conference on **Nuclear and Space Radiation Effects**, July 18–22, at Stanford University, Palo Alto, Calif. Sponsors: Army Research Office, Institute of Electrical and Electronics Engineers, National Aeronautics and Space Administration, Office of Naval Research and the Air Force. Contact: Lt. Col. J. E. Houseworth, Physical Sciences Div., Army Research Office, Washington, D.C. (Area Code 202) OXford 4–3446.

AUGUST

1966 Linguistic Institute Conference on **Linguistic Method**, Aug. 1–3, at the University of California at Los Angeles. Sponsor: Air Force Office of Scientific Research. Contact: R. W. Swanson (SRI), Air Force Office of Scientific Research, Washington, D.C. 20333, (Area Code 202) OXford 6–5374.

Eleventh International Symposium on **Combustion**, Aug. 14–20, at the University of California, Berkeley, Calif. Co-sponsors: Ballistic Research Laboratory and the Combustion Institute of Pittsburgh, Pa. Contact Dr. R. J. Heaston, Physical Sciences Div. Army Research Office, 3045 Columbia Pike, Arlington, Va., (Area Code 202) OXford 4–3465.

Second **Computer & Information Sciences Symposium on Learning, Adaptation and Control in Information Systems**, Aug. 22–24, at Columbus, Ohio. Sponsors: Office of Naval Research, Battelle Memorial Institute, Ohio State University. Contact: Julius T. Tou, COINS Co-Chairman, Director, Communications Science Research Center, Battelle Memorial Institute, Columbus, Ohio, 43201.

Application of Generalized Functions to System Theory Conference, Aug. 25–26, at the State University of New York, Stony Brook, N.Y. Co-sponsors: Air Force Office of Scientific Research and Society for Industrial and Applied Mathematics. Contact: Capt. John Jones, Jr. (SRMA), Air Force Office of Scientific Research, Washington, D.C. 20333, (Area Code 202) OXford 6–1302.

Unguided Rocket Ballistics, Aug. 30–Sept. 1, at Texas Western College, El Paso, Tex. Sponsor: Army Electronics Research & Development Agency. Contact: V. C. Cochran, Army Electronics Research & Development Agency, White Sands Missile Range, N.M. 88002.

Logic, Computability and Automata, date and place undetermined. Co-sponsors: Hughes Aircraft Co. and the Rome Air Development Center. Contact: C. A. Constantino (EMID), Rome Air Development Center, Griffiss AFB, N.Y., 13440.

Ocean Electronics Symposium, Aug. 29–31, at Honolulu, Hawaii. Sponsor: Hawaii Section, Institute of Electrical and Electronics Engineers (IEEE). Contact: Robert R. Hill Chairman, IEEE Ocean Electronics Symposium Headquarters, 1441 Kapiolani Blvd., Suite 1320, Honolulu, Hawaii, 96814.

SEPTEMBER

U.S. National Committee for **Pure and Applied Biophysics** in connection with Second International Biophysics Congress, Sept. 5–9, in Vienna, Austria. Sponsor: Office of Naval Research. Contact: Mrs. P. H. Tenniswood, Code 444, Office of Naval Research, Washington, D.C. 20360, (Area Code 202) OXford 6–1538.

Sixth Symposium on Naval Hydrodynamics, **Maneuverability, Waves and Physics of Fluids**, Sept 29–30., Oct 3–4, at Washington, D.C. Sponsor: Office of Naval Research. Contact: Mrs. S. W. Doroff, Office of Naval Research, Code 438, Washington D.C. 20360, (Area Code 202) OXford 6–1433.

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An Evaluation of the Ultrasonic Machining Process. Rock Island Arsenal, Feb. 1966, 18 pp. Order No. AD–629 973. $1.

Interfacial Interaction in Composite Structures. Alpha Research & Development, Blue Island, Ill., for the Navy, Feb. 1966, 54 pp. Order No. AD–629 899. $3.

Thermal Conductivity of Pyrex Glass: Selected Values. Army Natick Laboratories, March 1966, 16 pp. Order No. AD–630 135. $1.

Government research and development reports are available to science and industry at price indicated from:

Clearinghouse for Federal and Scientific Information
Department of Commerce
Springfield, Va. 22151

Authorized DOD contractors and grantees may obtain these documents without charge from:

Defense Documentation Center
Cameron Station
Alexandria, Va. 22314

Youth Opportunity Campaign

(*Continued from Page 1*)

- I have directed a re-allocation of Economic Opportunity Act funds to permit an extention of the Neighborhood Youth Corps program to an additional 25,000 boys and girls.

I ask again that the Governor of each of the 50 states, and the Mayor of each city with a population of over 10,000, consider whether a trainee employment program like the one we are working out for the Federal Government will be possible and practicable. One percent of the number of their employees would be 30,000.

Task Force Appointment.

I am asking the Vice President as Chairman of the Youth Opportunity Task Force to appoint an advisory committee to implement and work out the details of the program. This advisory committee will include representatives of the U.S. Department of Commerce, the U.S. Department of Labor, the Small Business Administration, state and local governments, and business and labor organizations.

It must be clear that this program will be worthwhile only if it means extra work-training opportunities over and above those which would normally be offered. It would be worthless or worse if this program only replaced regular employment opportunities.

It must also be clear that we cannot and do not assure all boys and girls work this summer. We all will do the best we can.

A boy or girl who wants a chance to work and who is denied that chance costs this country more than it can afford. This is a special problem demanding special attention.

DLSC Establishes Codification Division

A new international codification division has been established at the Defense Logistics Services Center (DLSC), Battle Creek, Mich., to improve the center's service to NATO.

Captain William E. Sigman, USN, former DOD representative on the three-man Technical Secretariat to the NATO Panel on Codification of Equipment, will direct the division.

The new unit's job is primarily the preparation of supply item identification and the assignment of stock numbers to items produced in the United States which are procured by NATO and other friendly foreign nations.

Nuclear Superiority

(*Continued from Page 4*)

efforts to determine the difference between earth motions caused by nuclear explosions and earthquakes.

Some extremely significant contributions to the test ban treaty safeguards have come from new techniques in the simulation of nuclear effects. Many of these techniques were developed by the Special Weapons Center and the Air Force Weapons Laboratory, also located at Kirtland AFB and a part of Systems Command's Research and Technology Division.

Effects simulation work began at Kirtland during the 1958–1961 moratorium on nuclear testing. (The Soviets broke the moratorium in 1961 by conducting a series of atmospheric tests.)

Important advances in the simulation state of the art have taken place since then. They have greatly increased our confidence in that some data produced by non-nuclear techniques is reliable and can be correlated with the effects of data obtained from nuclear explosions.

Present Special Weapons Center simulation capabilities are in the areas of nuclear shock and electromagnetic radiation. One form of shock simulation is carried out in a seismic impulse facility in which large systems components and subsystems can be tested. Another form of shock simulation is achieved with a new technique involving high explosives developed by the Weapons Laboratory.

Electromagnetic pulse simulation is carried out with 10-million-volt and 300,000-volt transportable surge generators that create current pulses approaching the current density of natural lightning and the electromagnetic pulse created by a nuclear explosion.

A new center-operated simulation facility will be used to study the effects of transient radiation on electronics. Two very large super-flash X-ray machines are presently under construction for the facility by Physics International Co. and Ion Physics Corp. Development of these machines, which has been guided by the Weapons Laboratory, is a major step forward in the simulation state of the art.

While it is assuming new responsibilities in the operation of nuclear effects simulators, the center continues to support Weapons Laboratory effects research and techniques development. This support includes environmental testing, high-speed photography, fabrication and checkout of payloads, and probe antenna design and checkout.

Still another important center contribution to the test ban treaty safeguards is our nuclear weapon systems test program which involves testing and certification of tie-down configuration for weapons carried in air transports, compatability of weapons to delivery aircraft, reliability of bomb racks and release systems for weapons delivery, development of air-launched, air-recoverable high altitude sampling rocket capabilities, and sensing devices for arming and fuzing systems.

The Special Weapons Center's role in maintaining our national safeguards under the test ban treaty is a very good indication of the Defense Department's determination to advance military nuclear technology at the fastest possible rate.

Our Government-industry team responsible for keeping the safeguards strong already has achieved a record of remarkable accomplishment. As new simulation techniques are developed, and new applications of nuclear energy explored, the record will become even more impressive.

DEFENSE PRIME CONTRACT AWARDS TO SMALL BUSINESS

(Amounts in Thousands)

	Jul 65–Feb 66	Jul 64–Feb 65
Procurement from All Firms	$20,042,934	$15,099,773
Procurement from Small Business Firms	4,275,718	3,181,477
Percent Small Business	21.3	21.1

NOTES FOR EDITORS

Briefed below are some events and projects within the Department of Defense which may be of interest to writers and editors. If further information on any of these topics is desired, please write to Chief, Magazine and Book Branch, Office of Assistant Secretary of Defense (Public Affairs), Washington, D.C. 20301

ARMY TESTS NEW LIGHTWEIGHT AIR CONDITIONERS

Two newly designed air conditioners built to protect electronics gear from damage caused by high temperatures and humidity are being tested by the U.S. Army.

The units are of lighter weight than air conditioners of similar capacities weighing 390 and 520 pounds compared with the 450 pounds and 1,200 pounds of units now used. Wrapper-type frame construction, plate fin compact heat exchangers and lightweight materials account for the weight reduction.

Production units will be used for cooling and dehumidifying missile fire control vans, communications shelters and housings for electronic systems.

NEW FOOD PRESERVATION PROCESS MAY INCREASE VARIETY IN G.I. DIET

Pilots forced to bail out over remote areas may find tasty dinners in their survival kits as a result of Army research on irradiated foods, a new technique hailed by scientists as the first really revolutionary preservation process since the discovery of thermal canning more than 150 years ago.

The new method could result in reduced refrigeration needs, lower food losses through spoilage, better control of food-borne diseases and wider availability of fresh meats and vegetables to field units in combat. The process could also furnish a greater variety of foods to combat personnel operating anywhere and under any conditions.

In the radiation process, the foods are packed and then receive a very small dose of gamma rays from a cobalt-60 source. No radiation remains in the treated food which is as healthful as any heat-processed food.

NEW ARMY COMBAT UNIFORM WILL GIVE GREATER PROTECTION TO TROOPS

The U.S. Army is developing a new all-climate combat uniform designed to give troops a higher degree of protection against such hazards as chemical, biological and radiological agents, thermal radiation and fragments from high-velocity missiles.

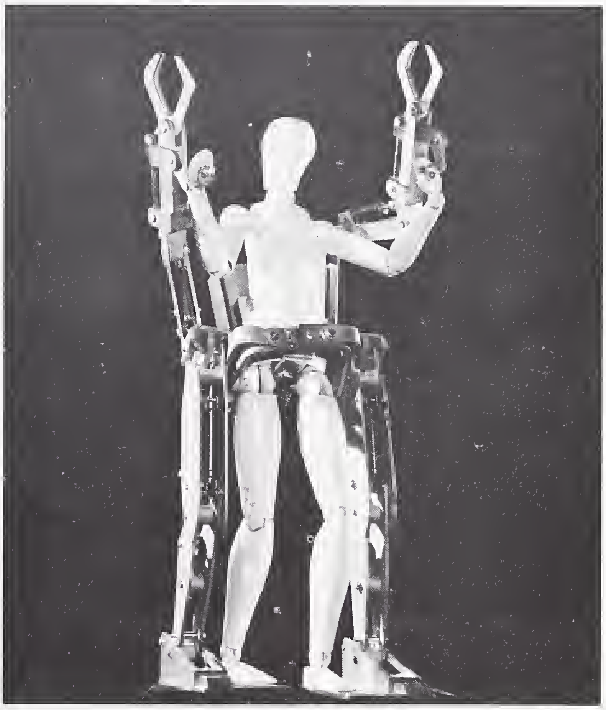
The uniform is a multifunctional protective system equipped with a heat regulation device for maintaining thermal balance regardless of weather conditions or activity. Heat regulation is achieved by circulating air within the clothing system. Main components of the total system consist of an integrated headgear assembly, a body ensemble including handwear and footwear and the integrated heat regulation unit. The prototype weighs 37 pounds.

SURFACE COATING OF SATELLITES STUDIED BY AIR FORCE

A satellite covered with four types of thermal-control coating is orbiting the earth as part of an Air Force experiment to find better surface coatings for present and future spacecraft and satellites.

The four types include solar reflective surfaces, solar absorbers, infra-red emitters and thin-film multi-layered coatings. All were subjected to vacuum, heat and ultraviolet radiation tests before being launched into space from Vandenberg AFB, Calif., March 30.

If the more promising ones fulfill expectations, their improved characteristics will enable future spacecraft and satellites to operate effectively for longer periods. The satellite will remain in orbit for a year with similar experiments planned for the future.



HARDIMAN

A set of mechanical muscles which will enable a man to lift 1,500 pounds while exerting only 40 pounds of force is being developed jointly by the Army and Navy. The unique apparatus, nicknamed "Hardiman," will be attached to an operator's feet, forearms and waist enabling him to perform tasks far beyond his normal strength. The Navy hopes to put Hardiman to work loading bombs on aircraft as well as handling heavy cargo in confined spaces and helping out with underwater salvage jobs.

The Framework of Army Research and Development

by
Brig Gen. R. B. Marlin, USA
Dir. of Plans and Programs
Office, Chief of Research and Development
Department of the Army

It can be said that the ultimate goal of any research and development effort is to build a better product than one's competitor. In the Defense R&D business the mission is to insure that we develop weapons, equipment and techniques qualitatively superior to those of any potential enemy, in any geographical environment, and under all conditions of war.

Similarly, any successful research and development effort—whether it be private industry or Defense—has to have a number of common components: an objective, qualified people in a workable organizational pattern and, of course, the *sine qua non*—money. For the benefit of those who are not familiar with Army R&D I will summarize the principal features of how the Army plans and determines its objectives, how it is organized for R&D, and how it allocates its R&D money and manages its programs.

In the area of planning I shall focus upon the organizations and procedures through which the Army evolves its broad materiel needs.

Guided by this planning, the next step in the Army process is the definition of systems needs and their justification to the satisfaction of the Army, the Office of the Secretary of Defense, the President, and ultimately to the Congress. At this point, these needs are requirements in that they represent a careful selection of potential advances eliminating the nice-to-have and reflecting real strides forward in combat capability. In this selection they have been subjected to a wide concensus in the Army, wherein the users' views of usefulness and battlefield compatibility have been paramount.

The third portion of the article is aimed at the nature of the program, its conduct, and a brief coverage of some of the management techniques employed.

As background for my further remarks with regard to these areas—there are three important influences which I must mention.

The first of these is the organization of the Army. In mid-1962 two new major Army commands were established. At that time the Army Materiel Command was created and given responsibility for the majority of the hardware development, procurement, and supply and distribution missions of the Army. This action gave central direction and control of these efforts. At the same time the Combat Development Command took over responsibility—under one commander—the previously scattered doctrinal, organizational and material requirements functions for the Army in the field.

The second influence is the necessary continual interplay between requirements definition and fulfillment, and the essential scientific and technological base. The Combat Developments Command (CDC) and the Army Materiel Command (AMC) work closely together so that real advances will result from this cross-feeding of information.

The third influence is the inherent complexity of the Army's problem in defining requirements based on its broad and varied mission. While concerned with all elements of the spectrum and conflict, the Army's major role in providing general purpose forces poses an infinite variety of potential requirements. This demands that planning, definition and fulfillment be selective, represent a balanced use of resources, and be productive within a reasonable time.

At this point, let me cover briefly the organization structure for Army R&D (Chart 1). At the top of the pyramid is the Secretary of the Army. He is responsible for all of the activities of the Department, to include those of research and development.

His principal assistant in these matters is the Assistant Secretary of the Army (Research and Development), who maintains policy supervision over the R&D program. He has a very small staff and relies upon the staff of the Chief of Research and Development (CRD) as may be required in the execution of his responsibilities.

Also involved, but to a lesser degree, is the Assistant Secretary of the Army (Installations & Logistics). He is primarily concerned with preproduction engineering and allied activities which provide the interface between R&D and the procurement of materiel item for Service use, as well as maintaining cognizance over all procurement policies, including those for R&D.

R&D budget requests and programming actions are reviewed and acted upon by the Office of the Assistant

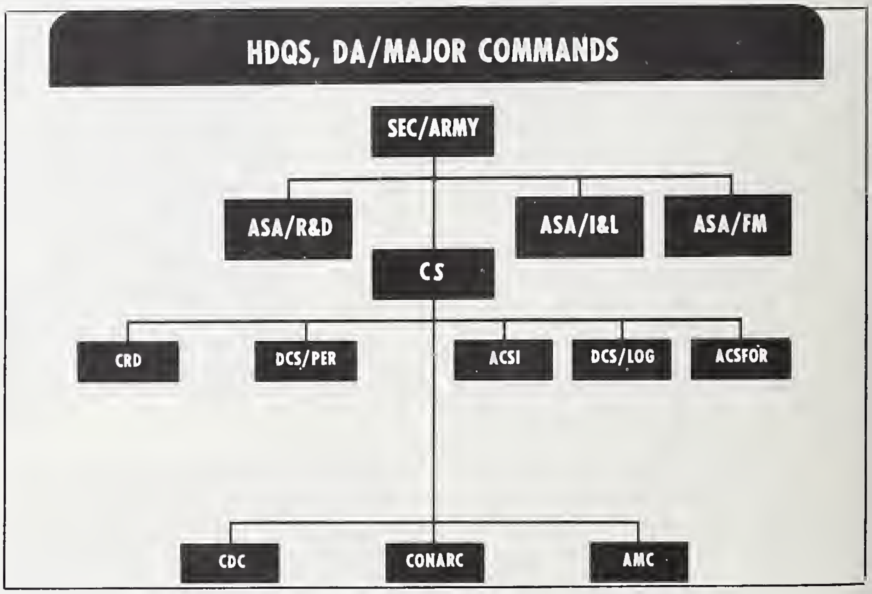


Chart 1.

Secretary of the Army (Financial Management). All of these abovementioned officials are civilians, appointed by the President.

The Chief of Research and Development is a three-star general and a member of the General Staff. He is responsible to the Chief of Staff of the Army for planning, programming and supervising all Army R&D, while the Deputy Chief of Staff for Personnel is interested in special R&D regarding personnel selection and classification research, and in the impact of materiel developments on the strength and skill levels of the Army. Also on the General Staff is the Assistant Chief of Staff for Intelligence (ACSI). He is responsible for technical intelligence activities, the coordination of surveillance and reconnaissance measures, and for monitoring projects of intelligence and reconnaissance appearing in the R&D program. The monitoring of logistical research and the supervision of production activities for items engineered for Service use is a responsibility of the Deputy Chief of Staff for Logistics, while the Assistant Chief of Staff for Force Development is responsible for supervision and coordination of combat developments and related policy in conjunction with the research and development function assigned to the Chief of Research and Development.

I will mention more on the execution of these General Staff responsibilities later.

As I noted earlier, the Commanding General of the Combat Developments Command is responsible for the doctrinal, organizational and materiel requirements function associated with combat developments or, simply put, determining how the Army of the future should be organized, how it should be equipped, and how it should fight. As an important part of this responsibility, CDC represents the Service users of materiel developed primarily for the Army in the field. The principal relationship of the Continental Army Command with Army R&D is in connection with training aids and devices for both individual and unit training.

The Army Materiel Command is the principal Army developing agency, with about 90 percent of the Army R&D budget expended by that command. Other major Army developing agencies include Office of the Chief of Engineers, Office of the Surgeon General and the U.S. Army Security Agency.

A principal criteria for Army R&D effort and the planning leading toward such effort is that it be requirements oriented. This orientation towards requirements stated by the potential user is conducted in an atmosphere which recognizes the so-called "push of technology." Strategy and doctrine, to include outline organization, is a prime motivator in the planning of Army R&D. The objective here is to insure that systems requirements are not originated in isolation, but are responsive to well conceived and integrated concepts of deployment and use. At the same time it is recognized that innovation may present a systems capability which may lead to new strategy and doctrine. Another important ingredient is provided by the somewhat longer range possibilities of science and technology—the future potentials stemming from a properly supported technological base.

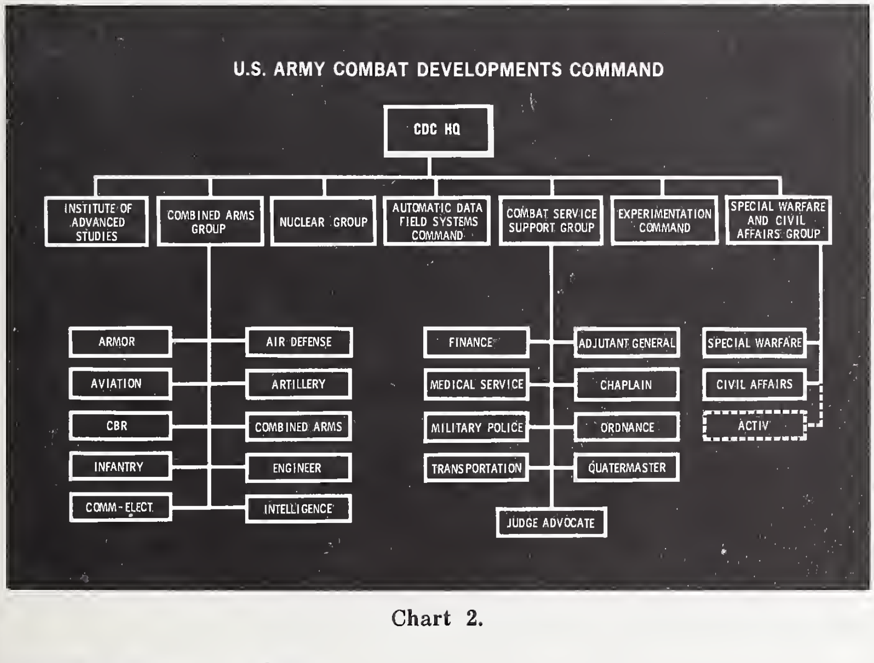


Chart 2.

The R&D planning concept, then, is based on the inter-action of the following factors: first, the Combat Developments system, which embraces the formulation of new doctrine, organization and materiel objectives and requirements and the early integration of these products into the Army, the means by which systems requirements are evolved; second, the Army Research Plan, which guides research and exploratory development, the vehicle for planning courses of action leading to advances in the technological base; third, the influence reflected in the Army family of plans, research and development plans, and certain Department of Defense planning documents.

Each plan in the Army family of plans is projected 20 years into the future. The keystone plan is the Basic Army Strategic Estimate (BASE), essentially a long range estimate of the situation which culminates in the statement of a broad strategic concept as it affects the land battle. The R&D input into this plan is the technological forecast portraying scientific and technical advances considered feasible within the time frame concerned. This forecast assumes full exploitation of these capabilities without regard to resource restraints and covers both anticipated U.S. capabilities and significant foreign capabilities.

The second important member of the family of plans is the Army Strategic Plan. This document reflects the strategic concepts contained in the BASE. As part of its coverage, the plan specifies a number of Priority Operational Requirements for materiel development. These requirements are purposely broad in nature to provide maximum flexibility in the means by which they may be met. For example, a current Priority Operational Requirement states the need to develop a capability to conduct operations at night under conditions of poor visibility but with near daylight efficiency. In aggregate, these Priority Operational Requirements describe important goals whose attainment would significantly improve operational capabilities. These goals guide both Combat Developments Plans and the Army Research Plan. The Army Force Development Plan insures that materiel which results from the R&D program is integrated into existing forces in a manner to best utilize available and on-coming resources. During the development of the plan, R&D personnel provide up-to-date information on the availability of systems under development and temper development progress in accordance with the schedules for the fielding of such systems.

I have already covered the concept of the Army Research Plan. It should be noted that its purpose is to provide a base for future systems and that it covers the research and exploratory development categories. Combat Developments Plans are a product of the CDC and, as approved by the Department of the Army, provide definitive materiel requirements for R&D effort in the advanced, engineering and operational systems development categories. Each developing agency also conducts both long-range and short-range planning for R&D. Long-range planning is aimed at the areas addressed in the technological forecast, while short-range planning covers the period of the Five Year Force Structure and Financial Program.

Another vitally important guidance document is the Army Five Year Force Structure and Financial Program. This is a planning document required by the Department of Defense for all Services, and it contains financial guidance over the immediate five-year period.

Having covered briefly the function of the Combat Developments system, let me elaborate on it a bit. The operation of the Combat Developments system is centered in the Combat Developments Command (Chart 2.)

The Institute of Advanced Studies prepares the long-range, broad-outline, concept studies which set forth what the Army should be like in the future. The Combined Arms Group develops the doctrine studies employing the types of division, corps and field armies associated with each particular time period. Derivative studies for each of the Combat Arms are developed by the subordinate agencies shown, as are initial materiel requirements stemming from such studies. Each of these agencies is collocated where possible with the Army service school and test and evaluation element with which it is associated. For example, the Armor Agency is located at Fort Knox, Ky., with the U.S. Army Armor School and the Armor Board. Thus, the formulation of doctrine and materiel requirements, the service tests of items of hardware, and school training are all conducted at armor installations and activities.

The Combat Service Support Group develops logistics doctrine and organizational concepts to support the combat elements in accordance with the overall conceptual study blueprint. The nine subordinate agencies of the Combat Service Support Group produce derivative studies and materiel requirements in the service support area similar to those produced by the subordinate agencies of the Combined Arms Group.

The Experimentation Command is the field laboratory for evaluating tactical and organizational concepts through battalion level.

The Special Warfare and Civil Affairs Group is responsible for stability operations, unconventional warfare, psychological operations and warfare, psychological operations and civil affairs. It also maintains close liaison with the Army Concept Team in Vietnam.

A key to success in the system is continuous liaison between the elements of CDC and the laboratories, arsenals and test facilities of the Army's developing agencies. The laboratory elements concerned accomplish their functions through both in-house and out-of-house work. About 70 percent of the total effort is accomplished out-of-house.

To describe this organization in general terms (Chart 3), the Chiefs of Research and Development directs and supervises the Army's Limited War Laboratory — a quick reaction capability—and, through the Director of Army Research, the research and exploratory development effort of seven research activities of a program-wide nature. The Surgeon General and the Chief of Engineers each direct the laboratory activities peculiar to their functions, while the Army Security Agency fulfills its laboratory requirements through contracts and through the laboratory facilities of the AMC Electronics Command.

Because of the wide scope of activities assigned, AMC maintains eight laboratories of command-wide interest, such as the Ballistics Research Laboratory, the Materials Research Agency and the Human Engineering Laboratory. In addition, the five Commodity Commands — Missile, Munitions, Weapons, Electronics and Mobility—each maintain a laboratory capability responsible to its particular commodity area. The Test & Evaluation Command controls the test boards, proving ground and test centers assigned to AMC.

Turning now to requirements definition, the materiel requirements of the Army are stated in four documents. First is the Qualitative Materiel Development Objective (QMDO),

(*Continued on Page 22*)

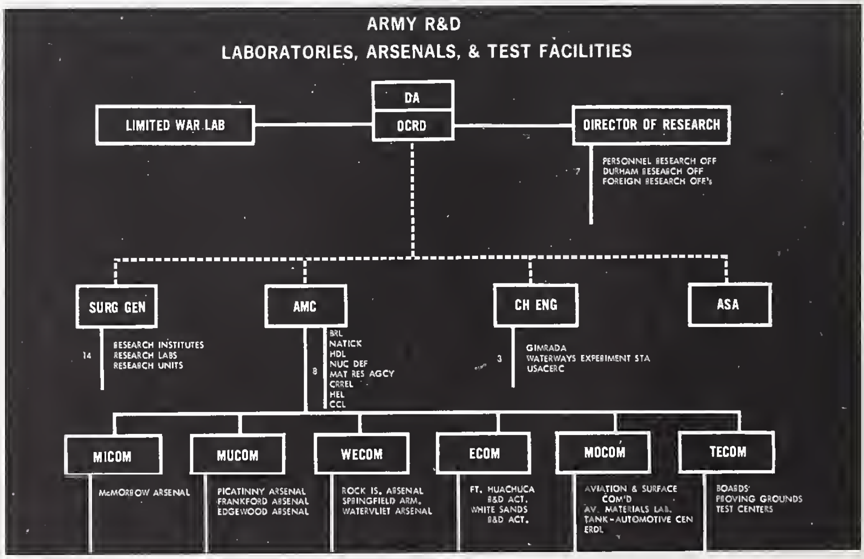


Chart 3.

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JUNE 1966

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31						

JULY 1966

SPEAKERS CALENDAR

DEPARTMENT OF DEFENSE

Lt. Gen. H. C. Donnelly, USAF, Dir., Defense Atomic Support Agency, at Memorial Day Observance, Santa Fe, N. M., May 30.

Brig. Gen. J. H. Weiner, USAF Chief of Staff, Defense Communcations Agency, at Institute of Electrical and Electronics Engineers, Philadelphia, Pa., June 15–16.

DEPARTMENT OF THE ARMY

Gen. Frank S. Besson, Jr., Commanding General, Army Materiel Command, at 150th anniversary of Remington Arms Co., Ilion, N.Y., June 16.

DEPARTMENT OF THE NAVY

Rear Adm. Edward J. Fahy, Chief, Ships Systems Command (new title for Bureau of Ships), at ROTC commissioning, Massachusetts Institute of Technology, Cambridge, Mass., June 9.

Rear Adm. Robert H. Speck, Commandant, Fourth Naval District, at Flag Day Luncheon, Philadelphia, June 13.

Hon. Robert H. B. Baldwin, Under Secretary of the Navy, at California Group of Investment Bankers Assn. Meeting, Long Beach, Calif., June 27.

Adm. Alfred G. Ward, U.S. Representative to NATO Standing Group and Military Committee, at Independence Day Celebration, Birmingham, Ala., July 4.

DEPARTMENT OF THE AIR FORCE

Hon. Harold Brown, Secretary of Air Force, at Council on Foreign Relations, New York City, June 6.

Dr. R. G. Loewy, Chief Scientist of the Air Force, at American Institute of Aeronautics and Astronautics Meeting, Columbus, Ohio, June 14–15.

Gen. B. A. Schriever, Commander, Air Force Systems Command, at American Institute of Aeronautics and Astronautics Meeting, Air Force Academy, Colo., June 15; at Tennessee Space Institute, Arnold AF Station, Tenn., July 11.

Brig. Gen. L. F. Tanberg, Dep. Chief of Staff for Materiel, Tactical Air Command, at Institute of Navigation Meeting, Cedar Rapids, Iowa, June 23.

Maj. Gen. B. I. Funk, Commander, Space Systems Div., Air Force Systems Command, at American Society for Quality Control Meeting, Los Angeles, June 28; at British United Services, Los Angeles, July 15.

Maj. Gen. M. C. Demler, Commander, Research & Technology Div., Air Force Systems Command, at Space & Ballistic Missile Technical Symposium, Air Force Academy, Colo., July 6–8.

Lt. Gen. W. A. Davis, Vice Commander, Air Force Systems Command, at Atlantic Research Conference, Costa Mesa, Calif., July 29.

Data Standardization Progresses

Varying requirements levied on the Defense Department for reporting to different organizations under different codes for geographic entities, foreign countries and the United States contributed largely to the establishment of the data standardization program reported in the *Bulletin* in February 1965.

Compound confusion and inability to provide proper and timely data resulted from the varying codes. A few among the differing requirements were personnel reports using a code from a civilian agency, a command and control system using a code based on spelling of the name, a different code for civil defense reports and another code entirely for use in financial records and reports. The codes ranged from two to four digits. More important, the definition and delimitation of terms differed since the geographic entities identified in any two of the codes differed.

Much analytic effort was required before any data interchange or system integration could be effected and, in some cases, reconciliation was impossible. The first data elements to be standardized under the program have been states of the United States, countries, continents and water areas. These standard data elements have been implemented in about 1,000 DOD data systems, allowing integration and interface between such systems as procurement, supply, and command and control. They provide for multi-functional application and the highest level of systems integration obtainable.

The data standardization program was initiated to assure the development and implementation of standard data elements and related codes, i.e., the words and terms used to communicate data and the codes used to represent them. The responsibility for the program was assigned to the Assistant Secretary of Defense (Comptroller).

The uncontrolled evolution of different English terms to identify the same piece of data, such as "Weapons System Designator" and "Account or Weapon System Code" to represent "Ownership Account," led to problems in the DOD data systems. If two systems need to interface and each produces data about a common piece of data identifying a common characteristic, unless the systems internally identify the common characteristic in precisely the same words, meaning precisely the same thing and coded precisely the same way, a varying degree of conversion and interpretation is required. Any conclusions and decisions resulting from analysis of the combined data may easily be erroneous.

Under the program, initiated in September 1964, 12 projects for data standardization have been undertaken within DOD. These projects have been assigned to the various DOD components for development of standard data elements and related codes. Some of the projects for standardization of the data elements and codes are:

- The Military Standard Contract Administration Procedures (MILSCAP) by the Defense Supply Agency.
- The Joint Uniform Military Pay System (JUMPS) by the Air Force.
- The National Military Command System by the Joint Chiefs of Staff.

Hundreds of data elements will be studied in these projects. It is anticipated that many existing codes and data expressions will be eliminated through the refining process of subjecting them to the disciplines of data standardization and developing standard data elements for use in all systems by all DOD organizations.

The impact of the standardization projects varies from such data elements as "Personnel Name," which is mainly used in the many personnel data systems, to such as the "Defense

(*Continued on Page 21*)

FROM THE SPEAKERS ROSTRUM

Excerpts from address by Mr. John M. Malloy, Dep. Asst. Secretary of Defense (Procurement), at the DOD Advanced Planning Briefings for Industry, Boston, Mass., March 3, 1966.

John M. Malloy

Procurement Management Trends

* * * * * *

Contractor's Weighted Average Share (CWAS).

I would like to discuss the first of three new programs that are still in the development stage. One of the more promising procurement concepts which is nearing reality is known as the Contractor's Weighted Average Share in Risk, and bears the euphonious acronym, CWAS. This concept, simply stated, recognizes that a contractor who accepts higher risk contracts has a greater financial motivation to exercise prudent business judgment in the performance of such contracts and, hence, should be given more latitude in performance. I should point out here that this approach will not apply to all of our 20,000 contractors. For example, a contractor whose total business with DOD is as a result of formal advertising will not be affected. Likewise, it will have no affect on other contractors who are involved only in negotiated fixed price competitive contracts. This type of contracting does not require audit review nor are administrative controls normally involved. Nevertheless, we do expect that this new and rather novel approach will be of interest to a great number of Defense contractors.

I mentioned earlier the marked improvements that have been achieved in the past several years in increasing price competition and reducing the usage of CPFF contracts by utilizing more fixed price and incentive contracts. When CWAS becomes effective in the Armed Service Procurement Regulation (ASPR), it will serve to relax or withdraw certain administrative controls and reasonableness overhead audits on those contractors who attain a verifiable "Weighted Average Share" of risk calculated from the mix of contracts being performed. Thus, the concept aligns itself with the procurement trend towards higher risk contracts. It is a very logical development.

The concept, objectives and detailed procedure for determining CWAS should be published early in the next fiscal year in the Armed Services Procurement Regulation. The CWAS technique will then be available, on a voluntary basis, to contractors of DOD. A contractor desiring to participate in this program may do so by determining his own CWAS factor in accordance with our procedures and submitting the requisite data through specified channels for verification. Validation of data relative to commercial or Government firm fixed price contracts may be accomplished by a certification to the data by a certified public accountant. The CWAS concept will be implemented in terms of a contractor's fiscal year.

CWAS is based on the spectrum of zero percent risk to 100 percent risk. A contractor with all cost type contracts would have a zero risk factor, a contractor with all firm fixed price contracts would have a 100 percent factor and a contractor with a mix of contracts would have a percentage of cost risk between these two points. The methodology and percentage currently being considered for use in determining the contractor's dollar cost risk by type of contract are as follows:

Type of Contract	Percentage Factor
Cost Plus Fixed Fee	0
Letter Contract	0
Cost Plus Incentive Fee	15%
Fixed Price Incentive	Per Formula
Firm Fixed Price	100%
Commercial	100%

* * * * * * * *

The development of the threshold, or level at which CWAS becomes applicable is a difficult task. To assist us in this effort, in August of 1965, we requested 176 contractors (many having multiple profit centers) stratified in a sample of small, medium and large, to voluntarily compute their CWAS factors. One hundred thirteen contractors having a total of 568 separate profit centers responded. Based on this study and other information available, the Defense Industry Advisory Council Working Group studying this concept recommended a threshold of 65 with a discretion band in the range of 50 to 64. We are now in the process of determining the exact span of the discretion band below the threshold. . . .

Formal comment from industry on these proposals will be solicited in the near future. If we establish the threshold at 65 (which is admittedly conservative), we expect that approximately two-thirds of the profit centers holding Defense contracts would qualify for CWAS, and these would account for approximately one-third of our procurement dollars. A large percentage of smaller companies will qualify initially, while a lesser percentage of the larger profit centers will qualify. In the case of large contractors, some profit centers will qualify while others will not. Experience may result in downward revision of the threshold at some future date.

We consider that the most beneficial results of CWAS will derive initially in the relief afforded from reasonableness audits of certain of our cost principles. In other words, we will accept as reasonable the amount of a particular overhead cost incurred by contractors who are above the threshold without further review. The underlying assumption is that the substantial proportion of high risk type contracts provides, by itself, adequate assurance of the reasonableness of incurred costs. It should be clearly understood, however, that CWAS applies only to indirect costs. Of the 47 cost principles set forth in ASPR, 15 would appear to be completely subject to CWAS, another 12 would be partially subject to CWAS, for a total of 27. Consideration has been deferred in four cost principles. The balance would not be subject to the CWAS test of reasonableness due to overriding statutory requirements or public policy considerations.

This concept will also have an effect on certain ASPR administrative controls. We are proposing ASPR revisions to make CWAS applicable to Overtime Approvals, Changes in Make or Buy Programs, Review of Contractor's Procurement Systems and Consent to Subcontracting. In other words, the Government would not involve itself in these areas in the administration of the contract in the case of contractors who are above the threshold of 65 percent. We are also prepared to make CWAS applicable to any other ASPR control that can reasonably be identified as a candidate. The DIAC Working Group on Administrative Controls, however, concluded after lengthy study, assisted by the Air Force tests in this area, that the problem of over-control was principally sourced in some lesser administrative requirement than the ASPR.

We are hopeful that this concept will also prove to be of interest and benefit to many subcontractors as well as to primes. Quite often audits are performed by Government personnel at the subcontract level. In such cases, the CWAS concept will apply. In addition, Government reviews of cost data submitted by subcontractors to primes will involve CWAS. Likewise, it would apply to such administrative controls as are applied at the subcontract level. Many of our subcontractors operate in a highly competitive environment which will almost automatically produce a high CWAS rating. Once this concept is operational, we feel sure that our primes will find many additional ways to take advantage of this approach.

Life Cycle Costing in Equipment Procurement.

The second new technique, and one that holds much promise for the future, has been publicized recently under the title of Life Cycle Costing in Equipment Procurement. This concept concerns itself with the influence that changes in suppliers may have on logistics costs and involves consideration of logistics costs in evaluating competitive bids. You may recall that Title 10 of the U.S. Code, Section 2305 (c) states:

> **". . . Awards shall be made with reasonable promptness by giving written notice to the responsible bidder whose bid conforms to the invitation and will be the most advantageous to the United States, *price and other factors considered. . . .*"** (*Italics supplied.*)

Traditionally, price has been the determining factor in competitive situations and price competition has meant frequent changes in suppliers. It is those "other factors" which we have heretofore not been able to get a handle on. Hence, this is what life cycle costing is all about—a methodology for defining those other factors in terms of logistics cost. The substantial increase recorded in competitive procurements in recent years has emphasized to us the importance of improving our capability to take these logistics costs into consideration when awarding contracts. It simply does not make sense to pay $10,000 for an equipment if the annual support cost amounts to $50,000 when another equipment serving the same purpose can be acquired for $12,000 and an annual support cost of only $25,000.

Our initial efforts in developing this concept will be concerned mainly with parts, subassemblies and minor subsystems which can be competed. But this represents in excess of six billion dollars annually at the prime level and should be of significant interest to many of you. The real task that must be accomplished is in developing methods for predicting and measuring logistics costs for use in evaluating bids. Ways to measure and evaluate some of these costs are more readily available than others. Thus, as we progress with this program, you will find that some obviously important logistics costs are not going to be involved in the evaluation of bids and proposals.

Any time this technique is used for procurement, the solicitation will contain very precise information as to the factors to be used in bid evaluation. There will be no surprises. Some of the evaluation factors will be based on Government studies as, for example, the cost of adding new items to our inventory. Others will be based on contractor supplied data. This type of data will be verified by the Government, usually by means of some form of demonstration.

Some of the logistics factors that are susceptible to influence by changes in suppliers are as follows:

- Corrective and preventive maintenance.
- Inventory management.
- Inspection, installation and check-out operations.
- Training.
- Transportation.
- Documentation.

The following example demonstrates the application of life cycle costing principles to a non-reparable item:

Navy Storage Battery Procurement

Bid	Unit Price	Discharge Cycle Guaranteed Charge	Discharge Cycle Cost Per Charge
A	$29.42	250	.11768
B	28.99	250	.11596
*C	31.55	400	.07888
D	32.77	250	.13108

* Award based on lowest cost per charge/discharge cycle.

Approximately 50 competitive procurements have been selected thus far by the Military Departments for possible award on a life cycle costing basis. As these tests are proceeding, the Military Departments are in the process of developing predictable cost factors for use in these test applications.

We consider successful implementation of this concept to be a relatively long term effort—perhaps as much as three years in the making. We do not pretend at this point in time to have all the answers we need.

I can assure you, however, that we intend to make every effort to get the answers and to take logistics costs into consideration at every possible opportunity. The concept is so rational and the objectives so important that we are determined to press on with this effort. By so doing, I am confident that in the long run substantial improvement can be made over the traditional disregard of logistics cost differences in contract award decisions in equipment procurement.

Total Package Concept.

Another development of major interest to us today is the emergence of the "total package concept" of procurement. This method of procurement was first employed on the C-5A aircraft and is currently being applied to the Navy's Fast Deployment Logistics Ship (FDL). The concept, developed by the Air Force, provides for the initial acquisition, through competition, of as much of a total system as is possible. As contrasted with our usual method of sequential procurement of development, followed by production, this new technique involves competing at the outset, not only the development phase but also production units and most of the logistics support, such as aerospace ground equipment and spare parts. Conceptually, we feel that this method of procurement offers substantial advantages and, if successfully proven in practice, represents a major breakthrough in contracting techniques.

In the past, the development contract for major systems has been awarded under circumstances that made it extremely difficult for us to avoid awarding the follow-on production contracts on other than a noncompetitive basis. The very large investment in engineering and tooling costs by the initial development source would have to be duplicated by the Government, or a potentially competing source, making practical competition impossible. Furthermore, under the past practice of sequential awards of development, production and support, the contractor had no positive incentive to look beyond the requirements of that part of the procurement cycle in which he was performing. Under the package procurement approach the contractor, being committed to the cost and performance of the production articles before detail design begins, has a strong incentive from the outset to design for economical production, reliable operation and low operating and maintenance costs, all of which are strongly influenced by actions taken during the design period. The objective is to realize the benefits that flow from a production commitment earlier in the acquisition cycle.

Total package contracting does nothing but apply to Defense procurement the concepts of a free economy operating in a market place environment and subject to the law of supply and demand. It simply allows the Government, like any buyer in the commercial world, to make a choice between competing products on the basis, not of estimates, but of binding commitments concerning the performance and price of operational equipment including, where practicable, life-time operating costs. It establishes these commitments competitively for as much of a program as practicable, and then permits the winning competitor's profit ultimately to be determined under an incentive arrangement which relates opportunity to risk. Profit is targeted initially in competition and is finally determined by the quality of the product and by the efficiency of the winning competitor, as it should be.

We have already seen in the initial experience of this new concept that the discipline required of both the Government and the competing contractors is substantially greater than under past practice. We have observed that with the increased commitment required of competitors, proposals were substantially more realistic and struck a better balance between performance and cost commitments.

This concept is now being used or contemplated for use on at least two other procurements, the Air Force's short range attack missile, and the Army's advanced aerial fire support system. Each potential application is based on a careful review of the suitability of the particular project for this approach. The extent to which this approach should be used in future DOD systems procurements is under study. We expect to apply it to selected systems that meet certain guidelines now under consideration.

We have had intensive studies under way ever since the emergence of this concept in order to develop criteria for applying a package plan to future selected programs. It is apparent that the fundamentals of this concept must be defined and the criteria for its application developed. Since it overlaps or interfaces with other DOD procedures, such as source selection, contract definition and data management, these interfaces must be studied to insure consistency and harmony. The problems associated with this new procedure must be identified and better understood. All these factors will be considered in the studies now under way. As part of these studies, it is our intention to examine the problems reported by subcontractors and vendors. These will be examined in the cumulative impact of not only the package procurement concept, but other policies and procedures affecting or controlling source selection, contract definition and associated actions.

What are the implications of this development for industry? This, of course, will become clearer as the studies now under way progress and as we gain experience in its use on these initial efforts. I would venture to speculate that the concept would not be applicable initially to more than a half dozen major systems annually. It is likely that the basic approach, involving something less than "total," will be used in other than major system procurements, for example, the development and limited production of a major subsystem or component. It is apparent that the discipline required prior to, during and after selection will be much more stringent than in past practice. It offers a truly competitive environment in which the opportunities for the efficient producer are greatly enhanced, both from the viewpoint of winning the competition and of the subsequent rewards for efficient technical and business management. With the increased responsibilities accruing to a contractor must come the relaxation of Government controls which are necessary without the constraints of competition. Opportunities for competent and efficient subcontractors and vendors will be enhanced, since the prime will have considerable incentive to establish and stay with the most competent and efficient subcontract and vendor structure possible.

As we see this new concept at this point, it offers great potential.

It also poses a very big challenge. The challenge is to insure that we are able to define the conditions requisite for its use; to be able to structure such contracts in a way that they will exert a continuing positive incentive on the contractor to design and produce the most cost effective system from a life cycle viewpoint and, at the same time, assure ourselves that contractors are not assuming abnormal or extreme risks not subject to their control.

As with any new concept, we are asking ourselves several basic questions at the present time:

- Will total package awards always be made to the low bidder, thus tempting the winning competitor to lower his quality, and give us shoddy equipment? We think not. This will be the result only if the contract is ignored or not enforced. Total package contracting does not require awards to be made to the low bidder. It does require performance and price commitments by competitors, and the award can then be made after considering all factors, in an integrated, meaningful manner.
- Will the disciplines inherent in total package contracting stifle innovation and creative technology? This is a legitimate concern, but I believe the danger can be avoided by expressing requirements in terms of performance, and by including performance incentives in the contract in a manner which relates improvements to their cost to the Government. Under the right circumstances, the opportunity for innovation and creative technology will be enhanced.
- Will the Government discipline itself to the realities of the authority-responsibility relationship inherent in total package contracting, that is, will it permit the contractor ample freedom of action to meet his commitments in his own way? This is critical. If we place responsibility on the contractor, then we must give him the authority to carry it out.
- Are we asking for too much data in total package competition, or are the competitors furnishing too much—or both? The answer is probably yes on both counts. Considerable improvements can be made in this area.
- Does total package contracting require too much competitor effort during the competition? I am the first to concede that a competitor must do a great deal of work before he can make commitments on a system for which the building blocks are in hand, but which has not yet been developed or tested as an integrated unit. But if contract definition is to accomplish its task of helping the Government to make a rational decision before proceeding with development, then the additional work needed for a competitor to make binding commitments on production units can be within reasonable bounds.
- A related question: Is this type of competition too expensive at both the prime and subcontract level? In view of the stakes, often including potential commercial sales, it is difficult to say how much is too much. Furthermore, in a free competitive economy, should the customer try to restrain the competition? Perhaps the Government should pay more for the help it receives in making a decision to proceed. In any event, we are giving close attention to this aspect.
- Is too much time required for us to pick a winner after all the proposals are in? On the C–5, it took five months. During this period, the competitors held much of their teams together, at great cost. Whether this can be improved, I do not know. I suspect so, if we emphasize performance rather than equipment specifications.
- The last question is, how far can we go in applying this technique? It must be limited to cases where the technical factors and risks, and the product, can be defined within reasonable limits. Above all else, we must be sure that we continue to acquire superior weapons. However, increasingly over the past several years, DoD has embarked on advanced development programs intended to establish experimentally the feasibility of subsystems and components before full development is initiated.

To sum up on this subject, it has been demonstrated thus far to our satisfaction that the package procurement concept is feasible and workable. It offers a potential that we intend to utilize fully. The decision to apply this concept, its impact upon contractors and subcontractors throughout the entire procurement process must all be carefully preplanned and integrated into the contract definition phase and reconciled with other existing DOD policies where an interface exists.

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Data Standardization

(*Continued from Page 17*)

Organizational Entity," which is used in almost every DOD system. Many of the data elements impact more broadly than DOD systems entering data systems throughout the Federal Government and some even through industrial data systems. Defense organizational entity is envisioned as one of these.

The Federal Government data standardization program, under the guidance of the Bureau of the Budget (BOB), has been initiated within the last year. Currently, eight projects have been undertaken in the same data spheres as the DOD projects which are being coordinated and tied in with the Government-wide efforts. Organizational work is in process under the sponsorship of the Business Equipment Manufacturers Association (BEMA) to extend standardization of data elements to the U. S. industrial and commercial community through the X.3 committee of American Standards Association (ASA). Five data standardization projects are under development.

An example of a data element project which is presently under development at all three levels is standardization of calendar date. A survey indicated that one of the DOD components used 77 different ways of expressing date, either in format or character, or both. A standard expression of date in six digits, in year, month and day sequence, has been recommended by DOD, BOB and the ad hoc ASA separate work groups, and will soon be circulated for official coordination.

The DOD approach to the program is to standardize the data elements and codes in data systems under development; standardize those data elements and codes common to most data systems throughout DOD; and standardize the remaining data elements and codes in existing operational data systems. These steps will be both sequential and simultaneous, depending on the case. Implementation of the standard data elements is a separate action from the standardization itself. It will be undertaken on a scheduled basis to make the least impact on operational data systems. Implementation of standard data elements will be individually scheduled by system or by data element.

To increase understanding of the standard element and codes program, briefing on its beginnings, its principles and its progress is currently being presented extensively to organizations so requesting by the Data Standards Division of the Office of the Assistant Secretary of Defense (Comptroller).

(*Continued from Page 16*)

which states a military need for materiel whose feasibility of attainment is unknown or in question. This document is a guide for research and exploratory development.

Next, the Advanced Development Objective (ADO) states a need believed feasible of attainment and covers items to be developed for experimental or operational test. The ADO guides effort in the advanced development category. Third is the Qualitative Materiel Requirement (QMR), which states a military need for a new item, system, or assemblage whose development is believed feasible. The QMR guides engineering development of an item for Service use. The fourth requirements document, the Small Development Requirement (SDR) covers minor items of proven feasibility. As the name describes, these are small developments which can be provided in a relatively short time, are not complex, and are of relatively low cost.

Army requirements documents are normally drafted by the appropriate Combat Developments agency. The preparing agency accomplishes coordination with other interested agencies of CDC and informally with the developing agency. The latter provides an early means of insuring interplay and exchange of concepts between the user and the technological base represented by the developer. The draft document is then forwarded through the Combat Developments group to Headquarters, CDC.

Headquarters, CDC, reviews and modifies the document as necessary and then effects formal coordination of the requirement with the appropriate developing agency—normally AMC. It is at this point that CDC again profits by the gamut of scientific skills of the developing agency. The requirement is also coordinated with other Army commands, with the other Services, and with certain allies.

Within the Department of the Army each requirement is reviewed by all interested agencies. Those requirements which will have a major impact on total Army resources are further referred to the Materiel Requirements Review Committee. This committee is a Chief of Staff committee composed of general officers from the Army Staff and from the major commands concerned. When Department of the Army approval has been granted, the requirements document is sent to the developing agency for the conduct of responsible research and development effort.

Systems analysis and cost effectiveness studies play an important part in the Army's definition of materiel requirements. These efforts vary in extent and formalization ranging from simple analysis of low costs, low density items to full examination of complex or high cost systems. The results of these studies reduce the unknowns and provide parameters to assist in decisions related to the initiation of development by answering such questions as: Is the system operationally suitable? Is development feasible? Is there a better way to perform the mission from a total cost standpoint? The Materiel Requirements Review Committee, which I mentioned earlier, often calls for a review of these considerations termed Total Feasibility.

The Chief of Research and Development has Army General Staff responsibility for the justification of the R&D program to the Office of the Secretary of Defense and to the Congress. Within the Office of the Secretary of Defense, the majority of these activities are conducted with the Office of the Director of Defense Research and Engineering. This relationship is carried out informally through personal contacts at all levels. Formal exchanges occur through ad hoc groups, memoranda, and documents established by DOD directive.

Related program justification type actions are carried out with the Office of the Assistant Secretary of Defense (Comptroller) primarily regarding financial matters and with the Office of the Assistant Secretary of Defense (Systems Analysis) in the areas of cost effectiveness and alternative programs.

The Army is also responsible for the detailed justification of its approved program to the various Congressional committees.

Another important insight into the Army R&D process lies in the area of program content and execution. Approximately 38 percent of the Army R&D program is devoted to "National Programs." These are projects which are being conducted as Army responsibilities and which are of overall major importance to the national interest. In this list are Nike-X, the Army's anti-ballistic missile system, and the National Range at White Sands.

Approximately 31 percent of the program is aimed at Army developments directly supporting Army responsibilities for the conduct of the land battle. The projects concerned range from relatively inexpensive items such as those for combat rations, clothing and equipment to major developments such as Lance. Another 23 percent of the program provides for the technological base and establishes the building blocks of science and technology for future Army systems. The remainder of the program, about eight percent, provides for service testing of Army equipment and for the operation and maintenance of Army R&D facilities.

As I mentioned earlier, the Five Year Force Structure and Financial Program furnishes financial guidance for the Army R&D program. This document is essentially an attempt to forecast in some detail the way the Army R&D monies will be spent over the coming five-year period. If you could look at the current version, you would note that the level of financial support for testing and facility operations and support for future systems is relatively stable over the period. However, a tapering off of Army developments and National Programs after 1968 appears, reflecting the movement of several projects out of the high cost areas of engineering and operational systems development. This trend is in accordance with the Program Change Proposal concept whereby new programs must constitute justified additions to the approved programs under way.

The detailed development of the R&D program, including the Base Program and the Program Change Proposals, begins some 18 to 20 months prior to the year of execution. In this process the Army provides program and financial guidance to the developing agencies. The programs are then developed in detail, originating at the laboratory level, and are successively reviewed by the Army Staff and the Office of the Secretary of Defense.

A special management technique used principally by the AMC is project managership. This technique is currently being applied to some 11 major research and development projects. The AMC project managers, who report to the Commanding General, AMC, control all resources allocated to the project concerned and can call on other elements of AMC for assistance. Through the use of this technique, project managers control about 37 percent of the R&D funds made available to AMC.

Each Army research and development project is closely monitored by a project officer located in the Office of the Chief of Research and Development. This officer is responsible for maintaining up-to-date information concerning the status of the project concerned, for pinpointing problems as early as possible, and for assisting in the resolution of such problems.

In addition, a system of Department of the Army system staff officers has been established to provide a focal point for up-to-date information on selected major projects. At the present time there are 34 items under system staff officer monitorship, including 26 containing research and development elements. The system staff officer coordinates, develops and maintains milestone schedules across the spectrum of personnel, training, research and development, acquisition and maintenance; monitors execution against these milestone schedules; and prepares consolidated periodic progress reports on the systems concerned.

Army technical committees meet monthly to maintain formal cognizance over the principal life-cycle events of Army materiel. In the research and development area these technical committees coordinate and record actions on the initiation and termination of projects and on the type classification of items for Service use.

The Department of the Army receives a number of periodic progress reports on research and development projects. Recurring program-wide reports emphasize program execution as well as financial status. Special reports cover areas such as reliability and maintainability.

Another technique used to manage the conduct of a development project is the "in-process" review. This review is a periodic stock-taking analysis conducted at selected critical points in the development cycle to evaluate the status and future course of the project. In addition to the developing agency, CDC, the Department of the Army Staff, and interested major field commands are represented at the in-process review.

This, then, is a summary of the Army's R&D structure. We do not contend it is a perfect system; in fact, we are continually seeking ways to improve it. However, it is a workable system which is producing the best products and that is our goal.

Agenda Set for DOD Education and Training Conference

The following is the program agenda for the conference on Engineering Systems for Education and Training to be held on June 14 and 15 at the Twin Bridges Marriott Motor Hotel, Washington, D.C. The conference will be sponsored by the Defense Department with the participation of the Office of Education and in affiliation with the National Security Industrial Association. (See article, "Industry Cooperation Sought To Improve Effectiveness of DOD Education and Training," *Defense Industry Bulletin*, April 1966.)

FIRST DAY

Morning Session: Keynotes.

Government representatives:

Hon. Thomas D. Morris, Assistant Secretary of Defense (Manpower).

Hon. Harold Howe, Commissioner, Office of Education.

Hon. Stanley Ruttenberg, Manpower Administrator, Department of Labor.

Industry representatives:

Dr. Sterling Livingston, Harvard University.

Mr. George Haller, Vice President for Advanced Technology Services, General Electric Co.

Afternoon Session: Service Presentations.

Each Military Service will describe briefly the scope and magnitude of its overall training programs. Training areas of priority concern to each Service will then be discussed in light of:

- The application of advanced technologies and management techniques to give industry an idea of DOD various stages of development in these areas.
- The degree to which industrial research and development, problem solving and equipment capabilities have been used successfully.
- Anticipated priority and problem areas over the next five years which industry might want to explore.

Speakers:

Brig. Gen. Frank Izenour, USA, Dir., Procurement, Training and Distribution, Office of Dep. Chief of Staff, Personnel, Department of the Army.

RAdm. Mason B. Freeman, USN, Asst. Chief for Education and Training, Bureau of Naval Personnel.

Maj. Gen. John H. Bell, USAF, Dir. of Personnel Training and Education, Office of Dep. Chief of Staff, Personnel, Department of the Air Force.

Col. Leo. V. Gross, USMC, Head, Training Branch, Office of Asst. Chief of Staff G-3, Headquarters, U.S. Marine Corps.

The Office of Education will present its policies and plans for various aspects of education technology.

Speaker:

Dr. R. Louis Bright, Associate Commissioner of Education.

SECOND DAY

Morning Session:

Adaption of Research to Technology.

Speakers:

Dr. Alexander Schure, Consultant, Office of Education, and President, New York Institute of Technology.

Dr. Launor Carter, Vice President, System Development Corporation.

Instructional Systems Technology.

A panel briefing on the specific Service projects which have utilized the systems approach to training problems and present DOD thinking about future expansion of this concept.

Computer-Based Information and Instruction Systems.

A panel briefing on use of computers as a management tool and as media for instruction in light of present usage, plans for expansion, trends in the state of the art, and particular problem areas for which automated data processing offers extreme potential.

Summary of Highlights of the Conference.

Speakers:

Mr. Marvin Kahn, Chairman, National Security Industrial Association Training Advisory Committee.

Dr. R. Louis Bright, Associate Commissioner of Education.

Hon. Thomas D. Morris, Assistant Secretary of Defense (Manpower).

For additional information and attendance applications contact:

Mr. Paul A. Newman
National Security Industrial Association
1030 15th St. NW
Washington, D.C.
Phone (Area Code 202) 296-2266

DEFENSE PROCUREMENT

Contracts of $1,000,000 and over awarded during the month of April 1966:

DEFENSE SUPPLY AGENCY

1—**Hyster Co.**, Portland, Ore. $1,567,215. 141 gasoline fork-lift trucks of 10,000 pound capacity each. Portland. Defense General Supply Center, Richmond, Va.

—**Howard Knit Products**, Gastonia, N.C. $1,153,005. 2,335,840 men's white undershirts. Gastonia. Defense Personnel Support Center, Philadelphia.

—**Delta Petroleum**, New Orleans. $3,341,704. 7,300,315 gallons of lubricating oil. Defense Fuel Supply Center, Alexandria, Va.

4—**Stebco Industries**, Chicago. $1,613,136. 215,660 pneumatic nylon mattresses. Chicago. Defense Personnel Support Center, Philadelphia.

—**Mason & Hughes**, Philadelphia. $1,818,090. 133,880 men's cotton twill flying coveralls. Philadelphia. Defense Personnel Support Center, Philadelphia.

—**Endicott Johnson Corp.**, Endicott, N.Y. $1,657,600. 175,000 pairs of combat service boots. Endicott. Defense Personnel Support Center, Philadelphia.

—**Pettibone Mulliken Corp.**, Government Defense Products Div., Washington, D.C. $2,024,366. 106 diesel fork-lift trucks. Washington, D.C. Defense General Supply Center, Richmond, Va.

5—**Cleary Uniform Co.**, New York City. $1,191,000. 30,000 men's wool gabardine overcoats. New York City. Defense Personnel Support Center, Philadelphia.

—**Howard Knit Products**, Gastonia, N.C. $1,254,908. 2,464,160 men's white undershirts. Gastonia. Defense Personnel Support Center, Philadelphia.

—**Alpha Industries**, Knoxville, Tenn. $1,032,000. 150,000 men's nylon cotton sateen field coats. Knoxville. Defense Personnel Support Center, Philadelphia.

—**Tucker Mfg. Co.**, Montgomery, Ala. $1,095,431. 3,577,500 wooden tent pins and 4,839,000 sixteen-inch-long wooden tent pins. Montgomery. Defense Personnel Support Center, Philadelphia.

6—**Sportwelt Shoe Co.**, Nashua, N.H. $3,393,000. 350,000 pairs of combat service boots. Nashua. Defense Personnel Support Center, Philadelphia.

7—**Graniteville Co.**, New York City. $1,102,113. 1,662,000 yards of cotton sateen cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**B. G. Colton**, division of Raylon Fabrics, New York City. $1,253,050. 475,000 linear yards of wind-fire and water-resistant cotton sateen cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**DeRossi & Sons**, Vineland, N.J. $1,189,423. 69,720 men's wool tropical coats. Vineland. Defense Personnel Support Center, Philadelphia.

—**Gulf Oil Corp.**, Houston, Tex. $2,351,116. Fuel oil and gasoline. Defense Fuel Supply Center, Alexandria, Va.

—**Atlantic Refining Co.**, Philadelphia. $1,163,780. Fuel oil and gasoline. Defense Fuel Supply Center, Alexandria, Va.

—**Hess Oil & Chemical Corp.**, Perth Amboy, N.J. $1,130,377. Fuel oil and gasoline. Defense Fuel Supply Center, Alexandria, Va.

—**Socony Mobil Oil Co.**, New York City. $1,043,458. Fuel oil and gasoline. Defense Fuel Supply Center, Alexandria, Va.

8—**Sterling Drug, Inc.**, New York City. $3,282,180. Primaquine and chloroquine products. New York City. Defense Personnel Support Center, Philadelphia.

—**Boothe Packing Co.**, Modesto, Calif. $1,369,807. Assembly of 1,662,408 cases of individual combat meals. Modesto. Defense Personnel Support Center, Philadelphia.

—**Wales Co.**, Boston, Mass. $1,316,000. 35,000 men's wool gabardine overcoats with removable liners. Boston. Defense Personnel Support Center, Philadelphia.

11—**J. P. Stevens & Co.**, New York City. $1,528,242. 185,560 wool blankets. Defense Personnel Support Center, Philadelphia.

—**Otis Elevator Co.**, Cleveland, Ohio. $1,156,200. 200 electric fork-lift trucks. Defense General Supply Center, Richmond, Va.

12—**Putnam Mills Corp.**, New York City. $1,188,720. 1,651,000 yards of nylon oxford cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**Putnam Mills Corp.**, New York City. $2,900,000. 4,000,000 yards of wind resistant cotton poplin cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**Dan River Mills, Inc.**, Danville, Va. $1,581,055. 1,990,000 yards of wind resistant cotton poplin cloth. Danville. Defense Personnel Support Center, Philadelphia.

—**Centre Mfg. Co.**, Centre, Ala. $2,490,667. 223,600 men's and 6,240 women's nylon raincoats and 840 women's raincoat hoods. Centre. Defense Personnel Support Center, Philadelphia.

—**J. P. Stevens & Co.**, New York City. $4,356,500. 1,650,000 linear yards of polyester fiber and wool tropical cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**J. P. Stevens & Co.**, New York City. $1,371,251. 720,000 yards of cotton-nylon oxford cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**Deering-Milliken, Inc.**, New York City. $1,924,560. 729,000 linear yards of polyester fiber and wool tropical cloth. New York City. Defense Personnel Support Center, Philadelphia.

15—**U.S. Rubber Co.**, Mishawaka, Ind. $7,068,486. Runway and taxiway membrane surfacing nylon. Mishawaka. Defense Construction Supply Center, Columbus, Ohio.

—**Otis Elevator Co.**, Cleveland, Ohio. $1,024,438. 206 fork lift trucks. Cleveland. Defense General Supply Center, Richmond, Va.

—**Marmac Industries**, Marysville, Mich. $1,590,285. 22,124 combat vehicle crewmen's helmets. Marysville. Defense Personnel Support Center, Philadelphia.

—**Endicott Johnson Corp.**, Endicott, N.Y. $1,009,000. 100,000 pairs of safety shoes with neoprene cork soles. Endicott. Defense Personnel Support Center, Philadelphia.

18—**Kaiser Steel Corp.**, Oakland, Calif. $23,930,000. 100,000 non-perforated steel landing mat sets. Oakland. Defense Construction Supply Center, Columbus, Ohio.

—**American Electric Co.**, Paramount, Calif. $10,132,195. 41,650 non-perforated steel landing mat sets. Paramount. Defense Construction Supply Center, Columbus, Ohio.

—**Townmotor Corp.**, Cleveland, Ohio. $1,850,200. 440 fork lift trucks. Cleveland. Defense General Supply Center, Richmond, Va.

—**Anderson Clayton & Co.**, Dallas, Tex. $1,084,470. 5,781,204 pounds of lard shortening compound. Dallas. Defense Personnel Support Center, Philadelphia.

—**Edgewood Casuals, Inc.**, Lexington, N.C. $1,395,475. 553,760 men's tan cotton four-ounce poplin shirts. Lexington. Defense Personnel Support Center, Philadelphia.

19—**Springs Cotton Mills**, New York City. $2,025,100. 3,080,000 yards of wind resistant cotton poplin cloth. New York City. Defense Personnel Support Center, Philadelphia.

—**Avondale Mills**, Sylacauga, Ala. $1,304,925. 2,055,000 yards of wind resistant cotton poplin cloth. Sylacauga. Defense Personnel Support Center, Philadelphia.

—**Waterbury Button Co.**, Waterbury, Conn. $1,097,676. 11,321,712 metal uniform buttons. Waterbury. Defense Personnel Support Center, Philadelphia.

—**Electro Plastic Fabrics, Inc.**, Pulaski, Va. $2,948,256. 583,320 coated nylon twill ponchos. Pulaski. Defense Personnel Support Center, Philadelphia.

—**Kenneth M. Wilson Co.**, Centerville, Tenn. $3,000,000. 500,000 coated nylon twill ponchos. Centerville. Defense Personnel Support Center, Philadelphia.

—**Hyster Co.**, Portland, Ore. $1,890,800. Two-hundred 15,000-pound gasoline fork lift trucks. Portland. Defense General Supply Center, Richmond, Va.

22—**Sierra Engineering Co.**, Sierra Madre, Calif. $1,009,490. 11,800 flying helmets. Sierra Madre. Defense Personnel Support Center, Philadelphia.

—**Trenton Textile Engineer & Mfg. Co.**, Trenton, N.J. $1,358,022. 70,760 nylon-duck rucksacks. Trenton. Defense Personnel Support Center, Philadelphia.

27—**Imperial Reading Corp.**, Blue Ridge Mfg. Div., New York City. $1,016,880. 456,000 blue denim cotton trousers. New York City. Defense Personnel Support Center, Philadelphia.

—**Rubber Fabricators, Inc.**, Grantsville, W. Va. $1,613,136. 215,660 pneumatic mattresses. Grantsville. Defense Personnel Support Center, Philadelphia.

—**Springs Cotton Mills**, New York City. $1,279,687. 1,950,000 linear yards of sateen cloth. New York City. Defense Personnel Support Center, Philadelphia.

28—**Hercules Powder Co.**, Wilmington, Del. $2,100,000. 400,000 gallons of herbicide. Defense General Supply Center, Richmond, Va.

29—**Humble Oil & Refining Co.**, Houston, Tex. $2,898,000. 750,000 barrels of diesel fuel oil. Defense Fuel Supply Center, Alexandria, Va.

—**Texas City Refining, Inc.**, Texas City, Tex. $4,548,726. 34,020,000 gallons of grade 115/145 aviation gasoline. Defense Fuel Supply Center, Alexandria, Va.

ARMY

1—**Sonetronics**, West Belmar, N.J. $1,306,371. Head set microphones. West Belmar. Army Electronics Command, Philadelphia.

—**Ford Motors**, Dearborn, Mich. $1,101,836. ¼-ton utility trucks. Highland Park, Mich. Army Mobility Command, Warren, Mich.

—**Martin-Marietta**, Orlando, Fla. $7,377,882. Development of Pershing missile components. Orlando. Army Missile Command, Huntsville, Ala.

—**Vinnell, McNamara, Mannix, and Fuller**, Alhambra, Calif. $20,816,779. Work on the John Day Lock and Dam Project, Sherman County, Oregon. Engineer Dist., Walla Walla, Wash.

—**City of Pine Bluff**, Ark. $1,463,000. Alteration and relocation work on Lock & Dam #4 Project, Arkansas River. Engineer Dist., Little Rock, Ark.

—**Standard Winding Co.**, Division of Ovirtron Corp., Newburgh, N.Y. $1,529,560. Production of radio amplifiers. Newburgh. Army Electronics Command, Philadelphia.

—**Bell Helicopter Co.**, Fort Worth, Tex. $2,797,576. Tail boom assemblies. Fort Worth. Army Aviation Material Command, St. Louis.

—**National Presto Industries**, Eau Claire, Wis. $18,847,460. High explosive artillery shells. Eau Claire. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Firestone Tire & Rubber Co.**, Akron, Ohio. $3,820,538. Metal parts for high explosive Anti-tank projectiles. New Bedford, Mass. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**National Lead Co.**, Pottstown, Pa. $1,300,063. Bomb body assemblies. Pottstown. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Carter Carburetor**, Division of ACF Industries, St. Louis. $3,446,967. Bomb metal parts. Olivette, Mo. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Mertz Engineering Co.**, Indianapolis, Ind. $2,617,140. Bomb dispenser assemblies. Indianapolis. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Batesville Mfg. Co.**, Batesville, Ark. $3,437,230. Bomb metal parts. Batesville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Industrial Metal Fabrication Co.**, Newark, N.J. $1,500,280. Shiping and storage containers. Wayne, N.J. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Temco, Inc.**, Nashville, Tenn. $1,771,997. Artillery illuminating shells. Nashville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Kisco Co.**, St. Louis. $1,273,702. Artillery cartridge metal parts. St. Louis. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Stelma, Inc.**, Stamford, Conn. $2,016,900. Telephone-telegraph terminals. Stamford. Army Electronics Command, Philadelphia.

—**Caterpillar Tractor Co.**, Peoria, Ill. $22,187,500. Tractors. Peoria. Army Mobility Equipment Center, St. Louis.

—**Stanford Research Institute**, Menlo Park, Calif. $2,218,159. Basic research in surveillance processes. Menlo Park. Army Research Office, Durham, N.C.

—**Federal Laboratories**, Saltsburg, Pa. $1,096,949. Hand grenades. Saltsburg. Edgewood Arsenal, Md.

—**AVCO Corp.**, Stratford, Conn. $6,002,589. T-53-L-11 and T-53-L-13 engines for the UH-1 helicopter. Stratford. Army Aviation Materiel Command, St. Louis.

—**United Aircraft**, **Sikorsky Aircraft Div.**, Stratford, Conn. $1,790,000. Long lead time items and components required for manufacture of CH-54A helicopters. Stratford. Army Aviation Materiel Command, St. Louis.

—**United Aircraft**, **Pratt & Whitney Aircraft Div.**, East Hartford, Conn. $1,210,000. Additional work on long lead time items and components required for manufacture of model engines for CH-54 aircraft. East Hartford. Army Aviation Materiel Command, St. Louis.

—**Eureka Williams Co.**, Bloomington, Ill. $2,092,451. Bomb fuzes and miscellaneous components. Bloomington. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Albion Malleable Iron Co.**, Albion, Mich. $1,712,340. Body and band assemblies for 81mm projectiles. Albion and North Richmond, Ind. Ammunition Procurement & Supply Agency, Joliet, Ill.

4—**Bell Helicopter, Division of Bell Aerospace Corp.**, Fort Worth, Tex. $1,264,896. HU-1 aircraft hub assemblies. Fort Worth. Army Aviation Materiel Command, St. Louis.

—**Flare-Northern Div.**, **Atlantic Research Corp.**, West Hanover, Mass. $1,031,723. Bomb case and fuze assemblies. West Hanover. Edgewood Arsenal, Md.

—**Universal Industries**, Chicago. $1,018,750. Telephone terminals. Chicago. Army Electronics Command, Philadelphia.

—**American Mfg. Co.**, Fort Worth, Tex. $1,476,300. 2.75 rocket warheads. Fort Worth. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Lehigh, Inc.**, Easton, Pa. $1,599,066. 2.75 rocket warheads. Easton. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Bulova Watch Co.**, Jackson Heights, N.Y. $1,338,900. 2.75 rocket fuzes. Woodside, N.Y. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**AVCO Corp.**, Richmond, Ind. $1,264,128. 2.75 rocket fuzes. Richmond. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Hamilton Watch Co.**, Lancaster, Pa. $1,296,841. 2.75 rocket fuzes. Lancaster. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Westclock Div.**, General Time Corp., LaSalle, Ill. $1,373,716. 2.75 rocket fuzes. LaSalle. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**KDI Corp.**, Cincinnati, Ohio. $1,235,807. 2.75 rocket fuzes. Cincinnati. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.**, Associated Products Div., East Alton, Ill. $1,807,656. 81mm mortar fuzes. East Alton. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.**, Associated Products Div., East Alton, Ill. $1,014,681. 81mm mortar illuminating shells. East Alton. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chamberlain Corp.**, Waterloo, Iowa. $1,354,450. Warhead metal parts. Waterloo. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Albion Malleable Iron Co.**, Albion, Mich. $1,169,015. Warhead metal parts. Albion. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Canadian Commercial Corp.**, Ottawa, Canada. $1,618,000. Warhead metal parts. Ingersal, Ontario, Canada. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Gibbs Mfg. & Research Corp.**, Janesville, Wis. $1,198,702. Rocket fuzes. Janesville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Airport Machinery Corp.**, Martin, Tenn. $1,319,050. Warhead metal parts. Martin. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Bell Helicopter Co.**. Fort Worth, Tex. $2,714,000. Two UH-1L prototype helicopters. Fort Worth. Army Aviation Materiel Command, St. Louis.

—**Motorola, Inc.**, Scottsdale, Ariz. $1,440,000. Radar data receiving and transmitting sets. Scottsdale. Army Electronics Command, Fort Monmouth, N.J.

—**Cutler-Hammer, Inc.**, Deer Park, N.Y. $1,900,000. Radar sets, battery assemblies, field maintenance kits, test facility kits and ancillary items. Deer Park. Army Electronics Command, Fort Monmouth, N.J.

—**Chamberlain Corp.**, Waterloo, Iowa. $2,490,100. Warhead metal parts. Waterloo. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**American Hoist & Derrick Co.**, St. Paul, Minn. $6,292,800. Wheel-mounted 20-ton cranes. Fort Wayne, Ind. Army Mobility Equipment Center, St. Louis.

5—**Herbert R. Imbt, Inc., and Nittany Materials, Inc.**, State College, Pa. $4,884,215. Work on the Blanchard Reservoir Project. Blanchard, Pa. Engineer Dist., Baltimore, Md.

—**Kaiser-Jeep Corp.**, Toledo, Ohio. $2,742,596. 436, various body types, 2½-ton trucks with Government furnished engines. South Bend, Ind. Army Mobility Command, Warren, Mich.

7—**LaCrosse Dredging Corp.**, Chicago. $1,493,862. Work on the Minnesota River Project. Near Minneapolis, Minn. Engineer Dist., St. Paul, Minn.

—**Johnson Furnace Co.**, Bellevue, Ohio. $1,793,710. 1½-ton cargo trailers. Bellevue. Army Tank Automotive Center, Warren, Mich.

—**Stevens Mfg. Co.**, Edensburg, Pa. $1,572,829. ¼-ton cargo trailers. Ebensburg. Army Tank Auotmotive Center, Warren, Mich.

—**Continental Motors Corp.**, Muskegon, Mich. $1,091,197. Multi-fuel engines for the 5-ton truck. Muskegon. Army Mobility Command, Warren, Mich.

—**Kaiser-Jeep Corp.**, Toledo, Ohio. $5,674,385. Five-ton trucks with Government furnished engines. South Bend, Ind. Army Mobility Command, Warren, Mich.

—**Philco Corp.**, Newport Beach, Calif. $1,093,552. Various quantities of spare parts for the SHILLELAGH missile system. Lawndale, Calif. Southwest Procurement Agency, Pasadena, Calif.

—**Gibralter Mfg Co.**, Port Huron, Mich. $1,069,160. 15,565 wheel sprockets for various combat vehicles. Fort Huron. Army Tank Automotive Center, Warren, Mich.

8—**Bell Helicopter Co.**, Fort Worth, Tex. $2,688,180. Transmission assemblies and tail boom asemsblies for the UH-1 helicopter. Fort Worth. Army Aviation Command, St. Louis.

—**Hercules Powder Co.**, Wilmington, Del. $2,675,792. Miscellaneous propellants and explosives. Radford, Va. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Collins Radio Co.**, Cedar Rapids, Iowa. $1,172,202. Miscellaneous repair parts and special tool lists for the AN/ARC-102 radio set. Cedar Rapids. Procurement Detachment, Chicago.

—**Sylvania Electric Products**, Needham, Mass. $2,500,000. Classified electronic equipment. Needham. Army Electronics Command, Fort Monmouth, N.J.

11—**Maremont Corp.**, Saco, Maine. $1,130,664. M60 machine guns, and barrel and bipod assemblies. Saco. Army Weapons Command, Rock Island, Ill.

—**U.S. Rubber Co.**, New York City. $2,411,986. Various quantities of explosives and support services. Joliet, Ill. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Tridea Electronics Co.**, South Pasadena, Calif. $1,250,000. Radio beacons and ancillary items. South Pasadena. Army Electronics Command, Philadelphia.

—**Standard Products Corp.**, Cleveland, Ohio. $2,537,068. Track sections for the M114 personnel carrier. Port Clinton, Ohio. Army Tank Automotive Center, Warren, Mich.

12—**Hamilton Watch Co.**, Lancaster, Pa. $1,526,932. Mechanical time fuzes. Lancaster. Frankford Arsenal, Philadelphia.

—**Bulova Watch Co.**, Woodside, N.Y. $1,985,350. Mechanical time fuzes. Woodside. Frankford Arsenal, Philadelphia.

—**Condec Corp.**, Stamford, Conn. $10,004,276. LARC V amphibious vehicles. Schenectady, N.Y. Army Mobility Equipment Center, St. Louis.

13—**Raytheon Co.**, Lexington, Mass. $15,043,446. Selected items of ground support and field maintenance equipment for the Hawk missile system. Andover, Mass. and Waltham, Mass. Army Missile Command, Huntsville, Ala.

—**Raytheon Co.**, Lexington, Mass. $2,847,408. Guidance and control systems for the Hawk missile system. Andover, Mass. Army Missile Command, Huntsville, Ala.

—**Chandler Evans, Inc.**, West Hartford, Conn. $3,114,000. Fuel control units for UH-1 helicopters. West Hartford. Army Aviation Command, St. Louis.

—**Grumman Aircraft Engineering Corp.**, Beth Page, N.Y. $8,820,000. Production of OV-1C Mohawk aircraft. Beth Page. Army Aviation Materiel Command, St. Louis.

—**LeTourneau-Westinghouse Co.**, Peoria, Ill. $5,247,000. 330 earth moving scrapers. Toccoa, Ga. Army Mobility Equipment Center, St. Louis.

—**Philco Corp.**, Newport Beach, Calif. $2,077,676. Grenade launchers and barrels. Anaheim, Calif. Army Weapons Command, Rock Island, Ill.

—**Continental Motors Corp.**, Muskegon, Mich. $2,403,602. Engine assemblies with accessories for ¼-ton trucks. Muskegon. Army Mobility Command, Warren, Mich.

—**Bell Helicopter Co.**, Fort Worth, Tex. $140,000,000. Continued production of UH 1B and UH-1D helicopters. Fort Worth. Army Aviation Materiel Command, St. Louis.

—**Bell Helicopter Co.**, Fort Worth, Tex. $20,420,000. UH-1H helicopters. Fort Worth. Army Aviation Materiel Command, St. Louis.

14—**Hupp Corp.**, Canton, Ohio. $2,632,843. 2,996 ten-horsepower engines and 2,438 twenty-horsepower engines. Canton. Army Mobility Equipment Center, St. Louis.

15—**Mason & Hanger—Silas Mason & Co., Inc.**, New York City. $2,393,877. Ordnance items and for operation and maintenance activities. Grand Island, Neb. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chamberlain Corp.**, Waterloo, Iowa. $2,087,901. Metal parts for artillery projectiles. Scranton, Pa. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**National Presto Industries**, Eau Claire, Wis. $7,602,176. Metal parts and components for 8-inch projectiles. Eau Claire. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**RCA**, Camden, N.J. $1,248,400. Radio sets and repair parts. Camden. Army Electronics Command, Philadelphia.

—**Champion Co.**, Springfield, Ohio. $1,340,623. Shipping and storage containers for bomb dispensers. Springfield. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Borg Warner Corp.**, Bellewood, Ill. $1,690,000. Metallic belts for 20mm cartridges. Bellewood. Frankford Arsenal, Philadelphia.

—**Vinnell Corp.**, Alhambra, Calif. $1,721,293. Design of an electrical land distribution system and procurement of all electrical material required for the system. Alhambra. Army Mobility Equipment Center, St. Louis.

—**AVCO Corp.**, Stratford, Conn. $3,695,400. Modification kits for T53 engines. $1,121,904. Rotor blades for T53 engines. Stratford. Army Aviation Materiel Command, St. Louis.

—**Philco Corp.**, Newport Beach, Calif. $1,689,466. Engineering services for the Chaparral Air Defense System. Newport Beach. Army Missile Command, Huntsville, Ala.

—**Chamberlain Corp.**, Waterloo, Iowa. $6,363,793. 175mm projectiles. Scranton, Pa. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chamberlain Corp.**, Waterloo, Iowa. $2,404,455. 4.2-inch illuminating cartridge bodies. Waterloo. Ammunition Procurement & Supply Agency, Joliet, Ill.

18—**Fenix & Scisson, Inc.**, Tulsa, Okla. $2,670,469. Work on the Laurel River Reservoir, Kentucky, Project. Corbin, Ky. Engineer Dist., Nashville, Tenn.

—**Mason & Hanger, Silas Mason & Co., Inc.**, New York City. $3,964,033. Various ordnance items. Burlington, Iowa. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Thiokol Chemical Corp.**, Bristol, Pa. $19,093,947. Various quantities and types of illuminating cartridges and signals. Marshall, Tex. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Ford Motors**, Dearborn, Mich. $12,389,812. ¼-ton trucks. Highland Park, Mich. Army Mobility Equipment Center, Warren, Mich.

—**Clark Equipment Co.**, Benton Harbor, Mich. $17,000,000. Industrial wheeled tractors. Benton Harbor. Army Mobility Equipment Center, St. Louis.

—**AVCO Corp.**, Richmond, Ind. $1,421,450. Metal parts for 40mm projectiles. Richmond. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Amron Corp.**, Waukesha, Wis. $1,971,384. 40mm cartridge cases. Waukesha. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Eisen Bros.**, Lodi, N.J. $2,685,189. 40mm projectile assemblies. Lodi. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Eastern Tool & Mfg. Co.**, Belleville, N.J. $1,478,538. 40mm metal parts. Belleville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Burroughs Corp.**, Paoli, Pa. $1,600,000. Automatic message processing system and ancillary items. Paoli. Army Electronics Command, Fort Monmouth, N.J.

—**Frank Briscoe Co.**, Newark, N.J. $5,602,924. Construction of a field house with multi-purpose athletic facilities at the Air Force Academy, Colorado Springs, Colo. Engineer Dist., Omaha, Neb.

19—**Carnegie Institute of Technology**, Pittsburgh, Pa. $1,564,000. Research in language programming. Pittsburgh. Defense Supply Service, Washington, D.C.

—**Zook Bros. Construction Co.**, Great Falls, Mont. $2,278,037. Excavation and clearing work on the Libby Dam Project, Libby, Mont. Engineer Dist., Seattle, Wash.

—**Fruehauf Corp.**, Detroit, Mich. $5,108,340. 5,000-gallon fuel tank semi-trailers. Omaha, Neb. Army Tank Automotive Center, Warren, Mich.

—**Walsh Construction Co.**, New York City and **S. J. Groves and Sons Co.**, Minneapolis, Minn. $43,906,727. Tunnel construction and relocation work on the Libby Dam Project, Libby, Mont. Engineer Dist., Seattle, Wash.

—**R. A. Heintz Construction Co.**, Portland, Ore. $4,947,191. Relocation and construction work on the Libby Dam Project, Libby, Mont. Engineer Dist., Seattle, Wash.

—**Granite Construction Co.**, Watsonville, Calif. $3,415,546. Work on the Alameda Creek Project. Fremont, Calif. Engineer Dist., San Francisco.

20—**Hughes Aircraft Co.**, Fullerton, Calif. $3,118,750. Radio sets with power supply and receiver transmitters with ancillary items. Fullerton. Army Electronics Command, Philadelphia.

—**Bushman Construction Co.**, St. Joseph, Mo. $1,018,487. Work on the Elkhorn River Basin Flood Control Project. Norfolk, Neb. Engineer Dist., Omaha, Neb.

—**Brandt Construction Co.**, and **John H. Brandt**, Lincoln, Neb. $1,447,604. Work on the main dam of the Branch Oak Reservoir Project, Lincoln, Neb. Engineer Dist., Omaha, Neb.

—**Eugene Luhr and Co.**, Sacramento, Calif. $3,712,999. Work on the Redwood Channel Project. Orick, Calif. Engineer Dist., San Francisco.

—**Western Electric Co.**, New York City. $2,750,000. NIKE HERCULES improved modification kits. Burlington, N.C. Army Missile Command, Huntsville, Ala.

—**Marando, Inc.**, Washington, D.C. $1,896,830. Construction of a four-story, 700 occupant enlisted women's barrack. Fort Myer, Va. Engineer Dist., Norfolk, Va.

21—**Hercules Powder Co.**, Wilmington, Del. $9,312,152. 2.75-inch rocket propellant grains and operation and maintenance activities at the Sunflower Army Ammunition Plant, Lawrence, Kan. Ammunition Procureemnt & Supply Agency, Joliet, Ill.

—**AVCO Corp.**, Cincinnati, Ohio. $3,662,385. Fixed-base mounted antennae. Cincinnati. Army Electronics Command, Philadelphia.

—**Raytheon Co.**, Lexington, Mass. $1,004,115. Maintenance and modification of special tooling and test equipment to support HAWK missile systems. Andover, Mass. Army Missile Command, Huntsville, Ala.

—**Baldwin Warren Co.**, San Francisco. $2,057,696. Work on the Walnut Creek Channel Project, Contra Costa County, Calif. Engineer Dist., Sacramento, Calif.

—**Guenther Mfg Co.**, Buchanan, N.Y. $1,060,460. 18,703 cargo parachute releases. Buchanan. Army Aviation Materiel Command, St. Louis.

—**Sperry Rand Corp.**, Phoenix, Ariz. $1,432,275. Gyro magnetic compass sets with ancillary items. Phoenix. Army Electronics Command, Fort Monmouth, N.J.

22—**AVCO Corp.**, Cincinnati, Ohio. $3,089,755. 4,869 receiver transmitters with ancillary items. Evendale, Ohio. Army Electronics Command, Philadelphia.

—**Stromberg Carlson Corp.**, Rochester, N.Y. $3,860,940. Sixteen fixed-plant telephone systems including installation, spares, commercial literature, maintenance tools and service tests. Rochester and Southeast Asia. Army Electronics Command, Fort Monmouth, N.J.

—**Continental Motors**, Muskegon, Mich. $2,425,000. Engines with containers for M60A1 and M48A3 tanks. Muskegon. Army Tank Automotive Center, Warren, Mich.

—**Arundel Corp.**, Baltimore, Md. and **L. E. Dixon Construction Co.**, San Gabriel, Calif. $17,195,034. Work on the Claiborne Lock and Dam Project, Claiborne. Ala. Engineer Dist., Mobile, Ala.

—**Orr & Sembower**, Reading, Pa. $4,026,621. 1,422 liquid dispensing tank and pump units for truck mounting. Reading. Army Mobility Equipment Center, St. Louis.

—**H. B. Zachry Co.**, San Antonio, Tex. $2,044,350. Facility requirement in support of expanded aviator training at 10 separate sites. Fort Wolters, Tex. Engineer Dist., Fort Worth, Tex.

25—**Amos Construction Co.**, Oklahoma City, Okla. $2,276,421. Runway and taxiway construction and lighting. Sheppard AFB, Tex. Engineer Dist., Alburquerque, N.M.

—**Poole & Kent Co.**, Miami, Fla. $1,036,000. Work on the C&S Florida Flood Control Project. Clewiston, Fla. Engineer Dist., Jacksonville, Fla.

—**Troup Bros.**, Coral Gables, Fla. $1,073,185. Construction and excavation work on the C&S Florida Flood Control Project. Miami, Fla. Engineer Dist., Jacksonville, Fla.

—**Basic Engineering & Construction Co.**, Logan, Utah. $1,466,527. Construction of a logistic and shop complex. Hill AFB, Utah. Engineer Dist., Sacramento, Calif.

26—**Western Electric**, New York City. $8,445,257. Research and development in connection with the Nike X System. Whippany, N.J. and Redondo Beach, Calif. Nike X Project Office, Huntsville, Ala.

—**Sperry Rand**, New York City. $11,410,856. 155mm, 105mm and 75mm ammunition components. Shreveport, La. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**San Ore Construction Co., Gardner Engineering Corp., and DBA S.O.G. of Oklahoma**, Houston, Tex. $19,750,378. Work on Webbers Falls Lock and Dam-Arkansas River, Oklahoma Project. Engineer Dist., Tulsa, Okla.

—**Olin Mathieson Chemical Corp.**, East Alton, Ill. $1,321,537. Propellant for 20mm cartridges. East Alton. Frankford Arsenal, Philadelphia.

—**Pace Corp.**, Memphis, Tenn. $4,167,857. Illuminating signals. Memphis. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Michael Harmonay Corp.** and **Raisler Corp.**, N.Y. $2,403,300. Work on the heating system for the new barracks at the U.S. Military Academy, West Point, N.Y. Engineer Dist., New York City.

—**Allis Chalmers Mfg. Co.**, Birmingham, Ala. $2,020,000. Design, manufacture, delivery, installation and test of two generators for the Carters Dam and Reservoir, Coosawattee River, Ga., project. West Allis, Wis. and Carters, Ga. Engineer Dist., Mobile, Ala.

—**Canadian Commercial Corp.**, Ottawa, Ontario, Canada. $1,408,836. Tube assemblies for ordnance items. Toronto. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Harvey Aluminum**, Torrance, Calif. $2,253,494. Ball projectiles for 20mm cartridges. Torrance. Frankford Arsenal, Philadelphia.

—**Brown & Root, Inc.**, Houston, Tex. $1,972,000. Expanded aviator training facilities at Mineral Wells Airport consisting of hanger, aprons, aircraft park and POL facilities at Fort Wolters, Tex. Engineer Dist., Fort Worth, Tex.

27—**Action Mfg. Co.**, Philadelphia. $1,443,606. 90mm anti-tank projectile fuzes. Philadelphia. Army Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Philco Corp.**, Communications & Electronics Div., Willow Grove, Pa. $5,000,000. Automatic digital message switching centers. Willow Grove. Army Electronics Command, Fort Monmouth, N.J.

—**Guy F. Atkinson Co.**, Long Beach, Calif. $4,976,405. Construction on Coyote Creek Channel, Los Angeles County, Calif. Buena Vista, Calif. Engineer Dist., Los Angeles.

—**S. J. Groves & Sons Co.**, Springfield, Ill. $11,617,104. Construction on Shelbyville Reservoir project, Kaskaskia River, Ill. Shelbyville, Ill. Engineer Dist., St. Louis.

—**Colt's Inc.**, Hartford, Conn. $1,224,000. M–16 and XM16E1 rifle magazines. Hartford. Army Weapons Command, Rock Island, Ill.

—**General Cable Corp.**, New York City $4,225,240. Cable assemblies. Roselle, N.Y. Army Electronics Command, Fort Monmouth, N.J.

—**Gibbs Mfg. & Research Corp.**, Janesville, Wis. $1,551,818. 2.75 rocket fuzes. Janesville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**KDI Corp.**, Cincinnati, Ohio. $1,547,371. 2.75 rocket fuzes. Cincinnati. Ammunition Procurement & Supply Agency, Joliet, Ill.

28—**Pfend & Brown, Inc.**, Milford, Ind. $1,040, 476. Work on the Salamonie Reservoir project. Wabash, Ind. Engineer Dist., Louisville, Ky.

—**AVCO Corp.**, Stratford, Conn. $3,203,900. Repair parts for helicopter gas turbine engines. Stratford. Army Aviation Materiel Command, St. Louis.

—**General Motors**, Diesel Engine Div., Detroit. $1,768,508. Six cylinder engines. Detroit. Army Automotive Center, Warren, Mich.

—**Western Electric Co.**, New York City. $1,106,944. Nike-Hercules research and development services. Burlington, N.C. Army Missile Command, Huntsville, Ala.

—**I.D. Precision Components Corp.**, Jamaica, N.Y. $1,144,000. 81mm mortar fuzes. Jamaica. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Wilkinson Mfg. Co.**, Fort Calhoun, Neb. $1,192,400. 81mm mortar fuzes. Fort Calhoun. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Action Mfg. Co.**, Philadelphia. $1,218,800. 81mm mortar fuzes. Philadelphia. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Columbus Milpar & Mfg. Co.**, Columbus, Ohio. $1,164,900. 81mm mortar fuzes. Westerville, Ohio. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**REDM Corp.**, Wayne, N.J. $1,210,000. 81mm mortar fuzes. Wayne. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Grand Machining Co.**, Detroit. $1,751,680. 81mm mortar fin assemblies. Vero Beach, Fla. Ammunition Procurement & Supply Agency. Joliet, Ill.

—**Albion Malleable Iron Co.**, Albion, Mich. $1,386,180. Projectile body assemblies. Albion. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Wagner Electric Co.**, St. Louis. $2,688,270. 4.2" mortar projectiles. St. Louis. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Kennedy Van Saun Corp.**, Danville, Pa. $2,528,940. 4.2" mortar projectiles. Danville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Specialty Electronics Development Corp.**, Glendale, N.Y. $1,284,083. Telephone sets. South Bridge, Mass. Army Electronics Command, Philadelphia.

—**Bunker Ramo Corp.**, Canoga Park, Calif. $1,088,322. Universal automatic map compilation system. Canoga Park. Army Map Service, Corps of Engineers, Washington, D.C.

—**Vinnell Corp.**, Alhambra, Calif. $1,750,000. Construction and operation of a fourth echelon maintenance depot and floating dry dock. Southeast Asia. Army Mobility Equipment Center, St. Louis.

—**Baldwin Electronics Inc.**, Little Rock, Ark. $1,225,115. 2.75" rocket motors. Camden, Ark. Ammunition Procurement & Supply Agency, Joliet, Ill.

29—**Day & Zimmerman, Inc.**, Philadelphia. $9,203,142. Miscellaneous ammunition parts and items. Texarkana, Tex. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Harvey Aluminum Sales, Inc.**, Torrance, Calif. $2,871,930. 105mm, 106mm, 40mm, 81mm shells, and miscellaneous ammunition items. Milan, Tenn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Atlas Chemical Industries, Inc.**, Wilmington, Del. $10,120,703. Explosives. Chattanooga, Tenn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Conductrom Corp.**, Ann Arbor, Mich. $1,000,000. Classified research and development. Ann Arbor. Army Missile Command, Huntsville, Ala.

—**Hercules Powder Co.**, Wilmington, Del. $3,939,262. Miscellaneous propellant explosives. Radford, Va. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Sylvania Electronics Products, Inc.**, Needham, Mass. $1,000,000. Electronic equipment. Needham. Army Electronics Command, Fort Monmouth, N.J.

—**Global Construction**, Altadena, Calif. $1,758,161. Construction at Vandenburg AFB, Calif. Engineer Dist., Los Angeles.

—**Belock Instrument Corp.**, College Point, N.Y. $1,968,000. HAWK simulator trainers. College Point. Army Missile Command, Huntsville, Ala.

—**Hughes Tool Co.**, Culver City, Calif. $1,800,000. Armament sub-systems. Culver City. Army Weapons Command, Rock Island, Ill.

—**Philco Corp.**, Newport Beach, Calif. $1,225,550. Chaparral inspection equipment. Newport Beach. Army Missile Command, Huntsville, Ala.

—**Chrysler Corp.**, Marysville, Mich. $1,159,373. M113 family engines. Marysville. Army Automotive Center, Warren, Mich.

—**FMC Corp.**, San Jose, Calif. $15,000,000. Vehicles of the M113 family, and related kits. South Charleston, W. Va. Army Automobile Center, Warren, Mich.

—**Collins Radio Co.**, Cedar Rapids, Iowa. $3,418,191. Direction finders. Cedar Rapids. Army Electronics Command, Fort Monmouth, N.J.

—**New Mexico State University**, University Park, N.M. $1,117,223. Data reduction and computer services. University Park. White Sands Missile Range, N.M.

—**Chrysler Corp.**, Detroit. $3,668,905. Engine assemblies with containers. Marysville, Mich. Army Automotive Center, Warren, Mich.

—**General Motors**, Allison Div., Indianapolis, Ind. $1,656,935. Various types of transmissions. Indianapolis. Army Automotive Center, Warren, Mich.

—**Raytheon Co.**, Burlington, Mass. $2,863,633. Radio communications equipment. Hawthorne, Calif. Army Electronics Command, Philadelphia.

—**RCA**, Camden, N.J. $3,096,400. Radio sets. Camden. Army Electronics Command, Philadelphia.

—**LeTourneau-Westinghouse Co.**, Peoria, Ill. $3,849,953. Diesel engine road graders. Indianapolis, Ind. Army Mobility Equipment Center, St. Louis.

—**Canadian Commercial Corp.**, Ottawa, Canada. $1,597,500. 2.75" rocket warheads. Dundas, Ontario, Canada. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Canadian Commercial Corp.**, Ottawa, Canada. $1,712,250. 2.75" rocket warheads. Sarnia, Canada. Ammunition Procurement & Supply Agency, Joliet, Ill.

NAVY

1—**Carrier Air Conditioning Co.**, New York City. $1,045,275. Air conditioners for shipboard use. Syracuse, N.Y. Bureau of Ships.

—**United Boatbuilders**, Bellingham, Wash. $1,580,000. Construction of 40 plastic river patrol boats. Bellingham. Bureau of Ships.

—**M.I.T., Instrumentation Laboratory**, Cambridge, Mass. $1,000,000. Design and development of the Poseidon missile guidance system. Cambridge. Special Projects Office.

—**Standard Products Co.**, Cleveland, Ohio. $3,000,000. Eight 129 track section repair kits. Port Clinton, Ohio. Marine Corps.

4—**General Precision, Inc.**, Librascope Group, Glendale, Calif. $2,524,028. Torpedo fire control system components. Glendale. Bureau of Naval Weapons.

—**LTV Aerospace Corp.**, Vought Aeronautics Div., Dallas, Tex. $7,128,205. A–7–A aircraft. Dallas. Bureau of Naval Weapons.

—**Eclipse Pioneer Div., Bendix Corp.**, Teterboro, N.J. $2,904,458. Major components for automatic flight control systems used on A–4–E/TA–4–E aircraft. Teterboro. Navy Aviation Supply Office, Philadelphia.

—**Stelma, Inc.**, Stamford, Conn. $3,011,197. Telegraph terminal equipment for naval communications. Stamford. Navy Purchasing Office, Washington, D.C.

—**Westinghouse Electric Corp.**, Sunnyvale, Calif. $1,000,000. Development of the Poseidon missile launcher system. Sunnyvale. Special Projects Office.

—**Thiokol Chemical Corp.**, Reaction Motors Div., Denville, N.J. $1,828,950. Bullpup rocket engines. Rockaway, N.J. Bureau of Naval Weapons.

5—**United Aircraft**, Stratford, Conn. $16,923,800. CH–53A helicopters. Stratford. Bureau of Naval Weapons.

—**ITT Gilfillan Co.**, Los Angeles. $1,325,000. Radar landing systems for installation aboard aircraft carriers. Los Angeles. Bureau of Ships.

7—**Pacific Ship Repair, Inc.**, San Francisco. $1,220,000. Topside overhaul and repair of the ammunition ship USS RAINIER (AE–5). San Francisco. Industrial Manager, 12th Naval Dist.

—**Chromcraft Corp.**, St. Louis. $4,797,000. Production of rocket launchers. St. Louis. Bureau of Naval Weapons.

—**Sanders Associates**, Nashua, N.H. $4.441,880. Basic engineering and development of an air dropable ASW sonobuoy system. Nashua. Bureau of Naval Weapons.

—**Magnavox Co.**, Fort Wayne, Ind. $4,111,764. Basic engineering and development of an air droppable ASW sonobuoy system. Fort Wayne. Bureau of Naval Weapons.

—**Aerojet General Corp.**, Sacramento, Calif. $1,377,600. Nitroplasticizer for POLARIS A–3 missiles. Sacramento. Special Projects Office.

—**Aluminum Specialty Co.**, Manitowoc, Wis. $2,834,784. 20mm link cartridge disintegrating belts used for leading 20mm ammunition. Manitowoc. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Hazeltine Corp.**, Little Neck, N.Y. $3,962,122. Sonar transducers for installation aboard naval ships. Braintree, Mass. and Little Neck. Bureau of Ships.

—**Aluminum Shapes, Inc.**, Delair, N.J. $1,225,319. AM–2 aluminum extrusions for airfields. Delair. Naval Air Engineering Center, Philadelphia.

—**May Aluminum, Inc.**, El Campo, Tex. $2,164,326. AM–2 aluminum extrusions for airfields. El Campo. Naval Air Engineering Center, Philadelphia.

—**Kaiser Aluminum & Chemical Sales, Inc.** Halethorpe, Md. $2,473,999. AM–2 aluminum extrusions for airfields. Halethorpe. Naval Air Engineering Center, Philadelphia.

—**Southern Extrusions, Inc.**, Magnolia, Ark. $1,462,230. AM-2 aluminum extrusions for airfiields. Magnolia. Naval Air Engineering Center, Philadelphia.

8—**Magnavox Co.**, Fort Wayne Ind. $1,780,300. Classified project. Bureau of Naval Weapons.

11—**Teletype Corp.**, Skokie, Ill. $2,243,022. Teletype equipment for installation aboard surface ships. Skokie. Bureau of Ships.

—**General Motors**, LaGrange, Ill. $3,934,700. Non-magnetic propulsion diesel engines for ocean minesweepers. McCook, Ill. Bureau of Ships.

—**Westinghouse Electric**, Baltimore, Md. $3,800,000. Long lead time items and effort for procurement of airborne radar sets for the Air Force. Baltimore. Bureau of Naval Weapons.

—**Stewart-Warner Corp.**, Chicago. $1,548,308. Components for the ARN-52 aircraft navigational set. Chicago. Navy Purchasing Office, Washington, D.C.

12—**Universal Match Corp.**, Ferguson, Mo. $3,451,949. Launching groups and a control panel to be installed on ships for missile launching. Ferguson. Navy Purchasing Office, Washington, D.C.

—**United Aircraft, Pratt & Whitney Div.**, East Hartford, Conn. $1,005,140. Miscellaneous spare parts for the J–57 engine used on B–52 and KC–135 aircraft. East Hartford. Navy Aviation Supply Office, Philadelphia.

13—**George Washington University**, Washington, D.C. $1,127,000. Research on logistics computer services. Washington, D.C. Office of Naval Research, Washington, D.C.

14—**Douglas Aircraft**, Long Beach, Calif. $1,700,000. TA-4E aircraft. Long Beach. Bureau of Naval Weapons.

—**Douglas Aircraft**, Long Beach, Calif. $1,477,271. Ejector racks and related equipment. Torrance, Calif. Bureau of Naval Weapons.

—**General Dynamics, Electric Boat Div.**, Groton, Cinn. $1,147,927. Installation of fleet ballistic missile submarine training equipment. New London, Conn. Bureau of Ships.

—**United Aircraft**, East Hartford, Conn. $2,970,208. J52-P8A engines. East Hartford. Bureau of Naval Weapons.

—**United Aircraft**, East Hartford, Conn. $1,030,455. Miscellaneous spare parts for J48-T8/8A engines for F-9F aircraft. East Hartford. Navy Aviation Supply Office, Philadelphia.

15—**Bunker-Ramo Corp.**, Canoga Park, Calif. $4,000,000. Classified electronic equipment. Silver Spring, Md. and Canoga Park. Bureau of Naval Weapons.

—**General Electric**, Johnson City, N. Y. $3,027,696. Automatic flight control systems and related equipment for the Air Force. Johnson City. Bureau of Naval Weapons.

18—**General Dynamics, Electric Boat Div.**, Groton, Conn. $36,427,000. Construction of a submarine tender. Groton. Bureau of Ships.

—**General Precision, Inc.**, Glendale, Calif. $2,803,683. Fire control system for the MK 48 torpedo. Glendale. Bureau of Naval Weapons.

19—**Sanders Associates**, Nashua, N. H. $2,943,000. Research and development of pod-mounted noise jammers for Navy aircraft. Nashua. Bureau of Naval Weapons.

—**Stanford Research Institute**, Menlo Park, Calif. $1,195,765. Additional naval operations research. Office of Naval Research.

—**General Motors**, Milwaukee, Wis. $3,931,215. Design, development and fabrication of two prototype ship's self-contained navigation systems for test and evaluation by the Navy. Milwaukee. Bureau of Ships.

20—**Bermite Powder Co.**, Saugus, Calif. $4,218,000. JATO rocket motors for aircraft. Saugus. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Grumman Aircraft Engineering Corp.**, Bethpage, N. Y. $6,399,104. Long lead time effort for FY 66 procurement of A–6A aircraft. Bethpage. Bureau of Naval Weapons.

—**Sperry Rand Corp.**, St. Paul, Minn. $2,076,486. Radar fire-control equipment with associated material and engineering services. St. Paul. Bureau of Ships.

21—**United Aircraft**, Stratford, Conn. $9,123,800. CH–3E and HH–3E helicopters for the Air Force. Stratford. Bureau of Naval Weapons.

—**Borg Warner Corp.**, Chicago. $1,685,500. Machine tools in support if the MK 81 bomb production program. Chicago. Bureau of Naval Weapons.

—**American Electric, Inc.**, Paramount, Calif. $1,900,320. Mark 77 fire bombs. Paramount. Navy Ordnance Plant, Louisville, Ky.

—**Conco Engineering Works**, Mendota, Ill. $1,156,800. Mark 77 fire bombs. Mendota. Navy Ordnance Plant, Louisville, Ky.

—**Curtiss-Wright Corp.**, Wood-Ridge, N. J. 3,904,300. Kits to support J65–W16 engines for A–4B/C aircraft. Wood-Ridge. Navy Aviation Supply Office, Philadelphia.

—**General Electric**, Cincinnati, Ohio. $6,013,192. Spare parts for J79–GE10 engines to support F–4J aircraft. Cincinnati. Navy Aviation Supply Office, Philadelphia.

22—**Boeing Co.**, Morton, Pa. $2,478,080. Rotor blade droop snoots for use on CH/UH–46 helicopters. Morton. Navy Aviation Supply Office, Philadelphia.

26—**Johns Hopkins University**, Silver Spring, Md. $1,298,500. Research and development work for the Army and ARPA (Advanced Research Projects Agency). Silver Spring. Bureau of Naval Weapons.

—**Marlo Coil Co.**, St. Louis. $2,057,623. Air conditioning equipment for naval ships. St. Louis. Bureau of Ships.

27—**U.S. Steel Corp.**, Pittsburgh, Pa. $13,181,170. Mark 82 bomb bodies. $8,073,780. Mark 82 bomb bodies. $9,267,339. Mark 81 bomb bodies. McKeesport, Pa. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**American Mfg. Co.**, Fort Worth, Tex.

$2,829,897. Mark 82 bomb bodies. $6,520,500. Mark 82 bomb bodies. Fort Worth. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Grumman Aircraft Engineering Corp.**, Bethpage, N. Y. $5,525,00. Long lead time effort for planned FY 66 and FY 67 procurement of C–2A aircraft. $11,156,929. Increase long lead time effort for FY 66 procurement of A–6–A weapon systems. Bethpage. Bureau of Naval Weapons.

—**Norris-Thermidor Corp.**, Los Angeles. $8,490,017. Mark 81 bomb bodies. $7,056,443. Mark 82 bomb bodies. Los Angeles. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Intercontinental Mfg. Co.**, Garland, Tex. $7,129,020. Mark 82 bomb bodies. Garland. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**United Aircraft, Hamilton Standard Div.**, Windsor Locks, Conn. $2,118,048. Propeller systems for C–130 aircraft. Windsor Locks. Bureau of Naval Weapons.

—**AiResearch Mfg. Co. of Arizona,** division of Garrett Corp., Phoenix, Ariz. $1,252,015. Main parts for GTC95–2 power units for use in P–3–A aircraft. Phoenix. Navy Aviation Supply Office, Philadelphia.

—**American Machinery & Foundry Co.**, York, Pa. $15,970,500. Mark 82 bomb bodies. York. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Loral Electronics Systems Div.**, Loral Corp., Bronx, N. Y. $2,327,893. Components of doppler navigation radar sets for use on A–6 and P–3–A aircraft. Bronx. Navy Purchasing Office, Washington, D.C.

—**Litton Systems, Westrex Communications Div.**, New Rochelle, N. Y. $1,019,473. Tropospheric scatter communication system. Navy Purchasing Office, Washington, D.C.

—**Litton Systems, Westrex Communications Div.**, New Rochelle, N.Y. $1,019,473. Tropospheric scatter communication system. Navy Purchasing Office, Washington, D.C.

—**Borg-Warner Corp., Ingersoll Products Div.**, Chicago. $13,858,000. Mark 81 bomb bodies. Chicago. Navy Ships Parts Control Center, Mechanicsburg, Pa.

28—**Curtiss Wright Corp., Wright Aeronautical Div.**, Wood-Ridge, N. J. $2,277,608. Spare parts to suport the J65, R3350 and R1820 engines for installation in various Navy aircraft. Wood-Ridge. Navy Aviation Supply Office, Philadelphia.

29—**Gyrodyne Company of America**, Flowerfield, St. James, N. Y. $2,500,000. QH–50 drone helicopters. St. James. Bureau of Naval Weapons.

—**Avondale Shipyards**, New Orleans. $3,200,000. Aviation and repair of the hospital ship USS Sanctuary (AH–17). New Orleans. Bureau of Ships.

AIR FORCE

1—**Magnavox Co.**, Fort Wayne, Ind. $1,820,969. Production of aircraft radio sets. Fort Wayne. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Hazeltine Corp.**, Little Neck, N. Y. $2,948,195. Production of aircraft communication equipment. Little Neck. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $2,400,000. AGENA rocket launch services for 1966. Cocoa Beach, Fla. Space Systems Div. (AFSC), Los Angeles.

—**General Electric**, West Lynn, Mass. $3,000,000. Component improvement engineering program for the J–85 aircraft engine. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Goodyear Tire & Rubber Co.**, Akron, Ohio. $1,125,997. Wheel and brake assemblies for C–123 aircraft. Akron. Ogden Air Materiel Area (AFSC), Hill AFB, Utah.

—**Chicago Aerial Industries**, Barrington, Ill. $1,200,000. Production of aircraft camera systems. Barrington. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

4—**Maxson Electronics Corp.**, Great River, N. Y. $1,738,257. Production of fuze assemblies for aircraft bombs. Macon, Ga. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Continental Aviation & Engineering Corp.**, Detroit. $2,102,800. J–69 engines for target drone aircraft. Toledo, Ohio. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Federal Electric Corp.**, Richland, Wash. $1,979,760. Production of generator sets. Pasco, Wash. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**Raytheon Co., Space & Information Systems Div.**, Waltham, Mass. $2,924,000. Modification of the bomb-navigation system of the B–58 bomber. Waltham. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Sperry Gyroscope Co.**, Great Neck, N. Y. $1,090,000. Modification of the bomb navigation system of the B–58 bomber. Great Neck. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

5—**Sanders Associates**, Nashua, N.H. $1,600,000. Production of airborne radio direction finding equipment. Nashua. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Sperry Rand Corp.**, Great Neck, N. Y. $1,699,398. Production of components for LORAN navigational equipment. Great Neck. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Libby Welding Co.**, Kansas City, Mo. $1,244,581. Production of 160 generator sets. Kansas City. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**General Dynamics**, Fort Worth, Tex. $3,046,317. Inspection and repair of B–58 aircraft. Fort Worth. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**Lear Siegler, Inc.**, Grand Rapids, Mich. $3,251,536. Production of aircraft bombing computer sets. Grand Rapids. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

6—**AVCO Corp.**, Stratford, Conn. $1,200,000. Work on the Mark IIA re-entry vehicle. Stratford. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Boeing Co.**, Wichita, Kan. $10,255,493. Modification and maintenance of vertical tail fins for B–52 aircraft. Wichita. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Bendix Corp.**, Baltimore, Md. $1,205,798. Weather radar systems. Baltimore. Warner Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Stewart & Stevenson Services**, Houston, Tex. $1,351,302. Production of electrical power generators. Houston. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

7—**AVCO Corp.**, New York City. $3,500,000. Research, development and production of the MARK 17 re-entry vehicle system. Wilmington, Mass. and Stratford, Conn. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Kollsman Instrument Corp.**, Elmhurst, N.Y. $2,570,986. Production of flight instrumentes for C–141 aircraft. Elmhurst. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Bendix Corp.**, Teterboro, N. J. $2,839,202. Production of flight instruments for C–141 aircraft. Teterboro. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Stewart Warner Corp.**, Chicago. $1,003,995. Production of components for aircraft radar altimeters. Chicago. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

8—**Martin Marietta**, Denver, Colo. $7,568,000. Design, development, fabrication and delivery of a TITAN III space booster and associated equipment. Denver Space Systems Div. (AFSC), Los Angeles.

—**TRW, Inc.**, Redondo Beach, Calif. $1,200,000. Production of airborne tactical reconnaissance equipment. Redondo Beach. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

11—**McDonnell Aircraft**, St. Louis. $2,000,000. Work on the Manned Orbiting Laboratory program. St. Louis. Space Systems Div. (AFSC), Los Angeles.

12—**Ward LaFrance Truck Corp.**, Elmira Heights, N. Y. $1,792,472. Production of 56 aircraft towing tractors. Elmira Heights. Warner Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**A. G. Bartlett Co.**, Tulsa, Okla. $1,358,803. Conduct of base operations and maintenance services. Chandler, Ariz. Williams AFB, Chandler, Ariz.

—**Switlik Parachute Co.**, Trenton, N. J. $1,060,000. Production of cargo-type parachutes. Trenton. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**Curtiss Wright Corp.**, Wood-Ridge, N. J. $1,020,887. Production of H–34 helicopter engines. Wood-Ridge. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

13—**University of Illinois**, Urbana, Ill. $2,000,000. Development of a parallel processing computer. Urbana. Rome Air Development Center (AFSC), Griffiss AFB, N. Y.

—**General Dynamics Corp.**, San Diego, Calif. $1,153,642. Procurement of spare parts in support of the ATLAS/AGENA booster program. San Diego. Space Systems Div. (AFSC), Los Angeles.

—**Litton Systems Inc.**, Woodland Hills, Calif. $7,111,630. Production of electronic equipment for F–4D and F–4E aircraft. Salt Lake City, Utah and Duluth, Minn. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Lockheed Aircraft**, Sunnyvale, Calif. $5,505,000. Work on the GEMINI program target vehicle system. Sunnyvale. Space Systems Div. (AFSC), Los Angeles.

—**Boeing Co.**, Wichita, Kan. $1,408,100. Investigation of aircraft response to low-level critical air turbulence. Wichita. Systems Engineering Group, Research & Technology Div. (AFSC), Wright-Patterson AFB, Ohio.

15—**Garrett Corp.**, Torrance, Calif. $2,729,625. Production of F–4D aircraft components. Los Angeles. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Sperry Rand Corp.**, Great Neck, N. Y. $4,320,000. Production of components for LORAN navigational equipment. Great Neck. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**General Electric**, West Lynn, Mass. $ 3,068,492. Expansion of engine production facilities. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

18—**A. J. Industries, Inc.**, El Monte, Calif. $2,104,479. Production of 450 and 650-gallon wing fuel tanks for F–105 aircraft. El Monte. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

19—**Goodyear Tire & Rubber Co.**, Akron, Ohio. $1,484,964. Wheels and brakes for C–141A aircraft. Akron. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

20—**Litton Systems, Inc.**, Woodland Hills, Calif. $8,552,854. Avionics subsystems for F–4 aircraft. Woodland Hills. Aeronaueical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Lear Siegler, Inc.**, Grand Rapids, Mich. $1,007,818. Procurement of aircraft instruments for C–130 and T–38 aircraft. Grand Rapids. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Goodyear Aerospace Corp.**, Akron, Ohio. $1,363,600. Protective armor for C–130 aircraft. Akron. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Hughes Aircraft**, Fullerton, Calif. $6,750,000. An advanced radar system. Fullerton. Rome Air Development Center (AFSC), Griffiss AFB, N. Y.

22—**General Electric**, Johnson City, N. Y. $3,019,000. Gun sights for F–4 aircraft. Johnson City. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Hycon Mfg. Co.**, Monrovia, Calif. $2,500,000. KS–72 camera systems. Monrovia. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

25—**Olin Mathieson Chemical Corp.**, East Alton, Ill. $1,703,860. Cartridge-type engine starters for B–52, KC–135 and F–4 aircraft. East Alton. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Lockheed Aircraft**, Jamaica, N. Y. $1,540,000. Modification of C–121 aircraft. Jamaica. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**Aerojet-General Corp.**, Sacramento, Calif. $2,069,340. Procurement of solid-propellant rocket motors for the ATHENA program. Sacramento. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Douglas Aircraft**, Santa Monica, Calif. $1,059,750. Modernization of aerospace ground equipment. Santa Monica and Vandenberg AFB, Calif. Space Systems Div. (AFSC), Los Angeles.

26—**Servo Corp. of America**, Hicksville, N. Y. $1,531,412. Direction finder sets. Hicksville. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Lockheed Aircraft**, Marietta, Ga. $1,035,920. Technical data for the C–141A aircraft. Marietta. Warner Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**North American Aviation**, Anaheim, Calif. $1,851,000. Maintenance and repair of

Minuteman guidance and control equipment. Anaheim. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Litton Systems**, New Rochelle, N. Y. $3,444,748. Spare parts for a world wide high power ground-to-air communications system. New Rochelle. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**General Electric**, Philadelphia. $7,500,000. Research and development on the Mark 12 reentry program. Philadelphia. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

27—**General Electric**, West Lynn, Mass. $1,193,000. Component improvement program for J–85 aircraft engines. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Boeing Co.**, Morton, Pa. $18,520,500. Production of CH–47A helicopters.. Morton. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**AiResearch Mfg. Co.**, Phoenix, Ariz. $2,728,000. Production of gas turbine engines. Phoenix. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

28—**United Aircraft**, East Hartford, Conn. $1,516,354. Production of components for J–57 and T–34 aircraft engines. East Hartford. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**AVCO Corp.**, Stratford, Conn. $1,648,468. Additional production equipment at Air Force Plant 43. Stratford. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

29—**McDonnell Aircraft Corp.**, St. Louis. $2,071,882. Work on the Gemini spacecraft heat shield, for the Manned Orbiting Laboratory. St. Louis. Space Systems Div. (AFSC), Los Angeles.

Navy Sets Reliability Policy

The Secretary of the Navy has released a policy directive setting forth the Navy's requirements in regard to reliability of Naval material.

The new instruction, SECNAV Instruction 3900.36, dated Jan. 27, 1966, directs Navy and Marine Corps procurement offices to incorporate reliability provisions, including quantitative requirements in all specifications, exhibits, product descriptions, work statements and contractual clauses to be referred to or included in contracts for systems and associated material.

Also included in the policy instruction is the requirement that major consideration in all source selection action be given to contractor's reliability capability in both past performance and proposed programs.

Atmospheric Test Chamber in Operation by AF Laboratory

The Air Force Cambridge Research Laboratories have placed in operation an environment test chamber for simulating atmospheric pressures and temperatures found at altitudes up to 216,000 feet.

The chamber is being used to test, adjust, and calibrate balloon-borne instruments at various simulated altitudes. It can simulate atmospheric temperatures and pressures for flights of any duration, including atmospheric conditions at launch and ascent, at float altitudes, and descent.

Dr. Walter Wagner of the Aerospace Instrumentation Laboratory designed the test facility which was built by Tenney Engineering, Inc., of Union, N. J.

Configuration Management

(Continued from Page 3)

cation incompatibilities. At the time of delivery from the breakout contractor, the configuration records are used to define the "as-shipped" configuration.

Field Configuration Record. After delivery of equipment from a Pershing contractor's facility, detailed configuration definition must be maintained throughout the equipment service life. This is particularly important where significant quantities of equipment are deployed in such a manner that substitution and reallocation may take place without serious system performance problems. It became apparent early in the Pershing program that equipment must be modified in a manageable block in lieu of being updated on an individual, piecemeal basis. This was accomplished through a planned modification program utilizing contractor personnel.

For the Pershing Improved Programmer Test Station Program, a field configuration record system is being developed that will accomplish the same effect as the production configuration record, except that it will compare the as-built configuration to field configuration. Included in this comparison will be the exact status of the hardware configuration and all outstanding modifications—that is, those that have been planned for incorporation but have not been physically installed. The feedback system to show installation of modification kits will be accomplished utilizing the Army TAERS log system and associated Form 2407. Information will be available showing modifications required, modifications installed and modifications outstanding. This information can be made available for individual equipment serial numbers, blocks or lots of serial numbers, or the total deployed weapon system.

The configuration accounting techniques described above provide control of definition of hardware items from the initial engineering release and throughout production and field support of the system. This mechanized control provides greater simplification and the ability to handle extremely large quantities of data in a more timely manner than the manual means previously employed. Special information to resolve specific problems can be retrieved from the mechanized data file expeditiously in lieu of the previous method of using a large amount of manually prepared data requiring extensive research to solve specific problems.

Full impact of this program has not yet been felt; however, we now feel that all Pershing configurations in the field are defined.

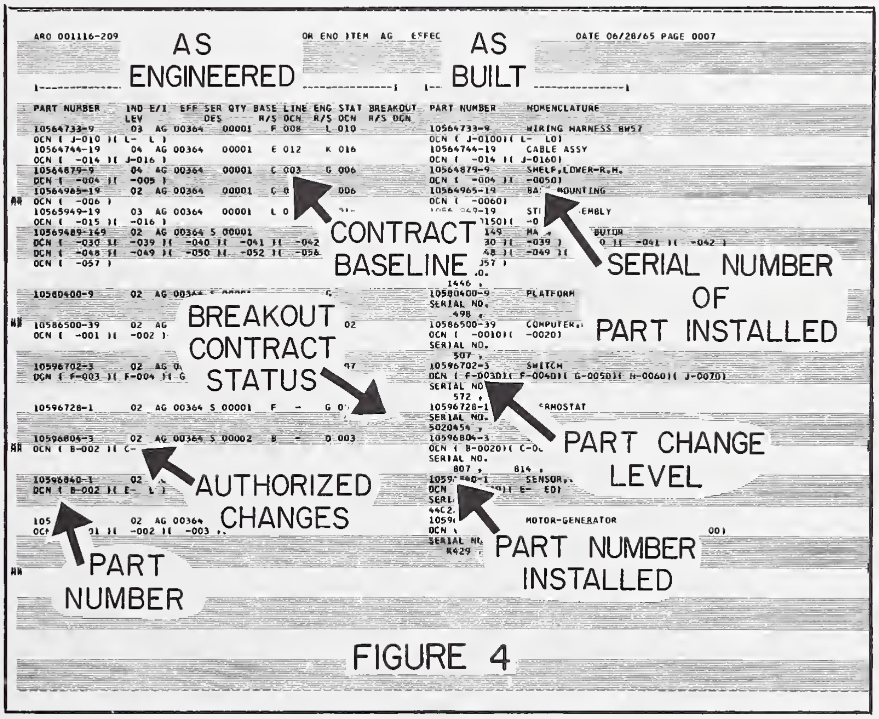
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FIGURE 4

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Air Force Funds 319 Unsolicited Proposals in First Half of FY 1966

The U.S. Air Force accepted and funded at a cost of $18.5 million more than one-fourth of the unsolicited proposals it received from the industrial and scientific community during the first half of FY 1966.

Of the 1,189 proposals given consideration, 319 were accepted topping the average number accepted during each of the past three full years. There has been a steady increase in both acceptances and fundings of unsolicited proposals since FY 1963 when only slightly more than seven percent were bought at a cost of $14.3 million. The number of voluntary proposals submitted has remained relatively stable each year. Since less average time has been spent evaluating unsolicited proposals this year, Air Force officials attribute the upswing in acceptance to the merits of the current proposals.

Major General Gerald F. Keeling, Deputy Chief of Staff for Procurement and Production, Air Force Systems Command, stated that unsolicited proposals are encouraged because they often represent an unexplored potential of scientific ingenuity and creative talent in individuals, universities, non-profit research agencies and industrial firms not normally dealing with the Air Force. "Many new firms, particularly small ones who would never have an opportunity to prove their worth otherwise, are able to establish their capabilities and qualifications through unsolicited proposals," said General Keeling. "We don't care about the size of a firm; it's the competence of its people that interests us. We welcome the opportunity to evaluate any ideas they have which might help us accomplish our mission of producing qualitatively superior aerospace systems."

To facilitate the submission of unsolicited proposals, a "Guide for Voluntary Unsolicited Proposals" has been prepared by the Systems Command. The guide tells where, when and how to submit a proposal. Names, mailing addresses and telephone numbers of responsible persons at focal points within Systems Command divisions, centers, ranges and laboratories are listed in the guide, and a brief description of the technical areas and scientific disciplines monitored by each of these persons is included.

A copy of the guide may be obtained from any Systems Command activity or write to Headquarters, Air Force Systems Command, Attention: SCKAE, Andrews AFB, Washington, D. C. 20331.

Oceanographic Study Results Published

The results of a study concerning problems encountered in the analysis of wave energy have been released by the U.S. Naval Oceanographic Office in a booklet titled, "Wave Hindcast Project North Atlantic Ocean (TR–183)."

From the information compiled it is hoped that specific predictions of deck motion can be applied to aircraft carrier landings. The project utilized numerical prediction techniques on a high-speed electronic computer. The input consisted of raw weather information to derive the surface wind direction and speed patterns over the ocean. This knowledge was further used as input to a highly complex computer program which describes wave direction and height by time interval between successive wave features.

The Bureau of Naval Weapons conducted the project with the assistance of the Travelers Research Center, New York University and the Lockheed-California Co.

The compiled results of the study, publication number TR–183, can be obtained for 75 cents from the U.S. Naval Oceanographic Office, Washington, D. C. 20390.